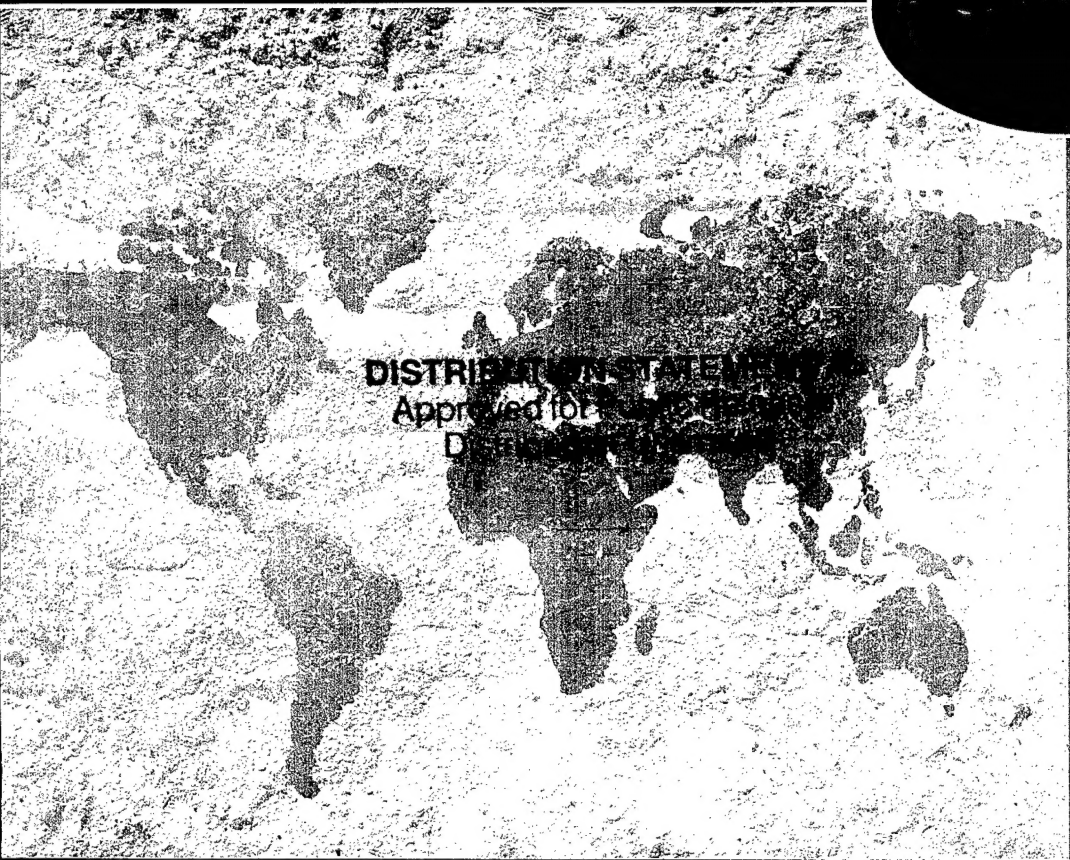
FAA

Fiscal Years

Aerospace

2001-2012

Forecasts



U.S. Department of Transportation

Federal Aviation Administration

Office of Aviation Policy & Plans

FAA-APO-01-1

March 2001

FAA FORECAST FACT SHEET [1]
FISCAL YEARS 2001-2012

THESE FIGURES REFLECT UPDATED FORECAST BASED ON OMB REVISED ECONOMIC OUTLOOK OF JANUARY 22, 2001

I. *2000 SUMMARY: ECONOMIC ACTIVITY AND AIR TRAVEL*

⇒ **U.S. Gross Domestic Product (GDP) increased 5.4%; world GDP was up 4.4%.**

⇒ **Domestic fares rose 3.2% while international fares rose 4.6%. In real terms (adjusted for inflation), domestic fares rose 0.1% and international fares increased 1.3%.**

⇒ **Domestic enplanements on commercial air carriers increased from 576.1M in 1999 to 604.1M (+4.9%) in 2000. U.S. air carrier international enplanements increased from 53.3M in 1999 to 54.6M (+ 2.4%) in 2000.**

⇒ **U.S. commercial air carriers reported an operating profit of $7.6B; in 1999 operating profits were $8.6B. Operating revenues increased to $126.8B (+8.3%) in 2000, while operating expenses increased to $119.2B (+10.0%).**

⇒ **In 2000 total landings and takeoffs at combined FAA and contract towers were up 0.8%. Of the four users of the system, only air carriers (+4.0%) and commuter/air taxis (+1.8%) increased their activity levels. General aviation (-0.5%) and the military (-1.2%) recorded declines.**

II. *ECONOMIC ASSUMPTIONS FOR FAA FORECASTS*

⇒ **U.S. real GDP is forecast to increase from $9.2T in 2000 to $9.5T (+2.7%) in 2001. Over the 12-year forecast period GDP is forecast to increase at an annual rate of 3.1%.**

⇒ **World GDP is forecast to increase from $27.7T in 2000 to $28.7T (+ 3.8%) in 2001. The average annual increase in world GDP over the forecast period is 3.4% a year.**

- **Asia/Pacific GDP increases 4.6% in 2001; average annual growth is 4.6%.**
- **Latin American GDP increases 4.5% in 2001; average annual growth is 4.4%.**
- **European GDP increases 3.3% in 2001; average annual growth is 2.8%.**
- **Canadian GDP increases 3.2% in 2001; average annual growth is 2.7%.**

---

[1] **All specified years are fiscal years (October 1 through September 30), and all specified quarters are calendar quarters, unless designated otherwise. All international economic data are in calendar years.**

⇒ **Inflation is projected to remain moderate over the 12-year forecast period, averaging 2.5% annually. Oil prices are forecast to decline slightly, falling at an average rate of 0.9%. In 2001 the oil and gas deflator decreases 5.0% and then declines 16.9% in 2002.**

III. *AVIATION ACTIVITY FORECASTS*

Commercial Air Carriers

⇒ **Domestic air carrier enplanements are expected to increase to 620.7M (+2.7%) in 2001, and grow 3.6% a year for the period 2000-2012, reaching 927.4M in 2012.**

⇒ **Total Passengers (U.S. and foreign flag carriers) to/from the U.S. are forecast to increase to 146.3M (+5.1%) in 2001, and grow 5.3% a year reaching 258.8M in 2012.**

- **Atlantic route passengers increase to 54.8M (+4.0%) in 2001, and grow 4.4% annually, reaching 88.7M in 2012.**
- **Pacific route passengers increase to 28.3M (+6.8%) in 2001, and grow 6.2% annually, reaching 54.3M in 2012.**
- **Latin American passengers increase to 41.7M (+5.8%) in 2001, and grow 6.4% annually, reaching 82.9M in 2012.**
- **Canadian transborder passengers increase to 21.5M (+4.4%) in 2001, and grow 4.0% annually, reaching 32.9M in 2012.**

⇒ **U.S. air carrier international enplanements are forecast to increase to 57.7M (+5.8%) in 2001, and grow 5.9% a year, reaching 108.4M in 2012.**

- **Atlantic route enplanements increase to 22.0M (+5.4%) in 2001, and grow 5.1% annually, reaching 37.9M in 2012.**
- **Pacific route enplanements increase to 11.8M (+5.4%) in 2001, and grow 6.1% annually, reaching 22.7M in 2012.**
- **Latin American route enplanements increase to 23.9M (+6.4%) in 2001, and grow 6.5% annually, reaching 47.8M in 2012.**

⇒ **Domestic passenger yields, adjusted for inflation, are forecast to remain flat at 14.42 cents (0.0%) in 2001. Real yields decline 1.4% a year, reaching 12.22 cents in 2012.**

- **International yields, adjusted for inflation, decline to 10.30 cents (-1.9%) in 2001. Real yields decline 0.9% annually, reaching 9.46 cents in 2012.**

⇒ **U.S. large air carrier passenger jet fleet increases from 4,417 aircraft in 2000 to 6,313 aircraft in 2012, an annual increase of 3.0%.**

Cargo

⇒ **Total air cargo RTMs (freight/express and mail) increase from 30.0B in 2000 to 58.6B in 2012—up 5.7% a year; freight/express RTMs up 5.9% a year; Domestic freight/express RTMs up 5.0% a year; international freight/express RTMs up 6.7% a year.**

⇒ **The cargo fleet increases from 1,073 aircraft in 2000 to 1,760 aircraft in 2012, an increase of 4.2% a year.**

Regionals/Commuters

⇒ **Commuter enplanements are forecast to increase to 84.1M (+5.7%) in 2001, and grow 5.7% a year, reaching 154.1M in 2012.**

⇒ **The commuter passenger fleet increases from 2,312 aircraft in 2000 to 3,673 aircraft in 2012, an annual increase of 3.9%.**

- **The regional jet fleet increases from 569 aircraft in 2000 to 2,190 aircraft in 2012, an annual increase of 11.9%**

General Aviation

⇒ **The general aviation fleet increases from 221,200 aircraft in 2000 to 246,000 in 2012, growing 0.9% a year.**

- **The turboprop/turbojet fleet, the fastest growing segment, is forecast to increase 3.0% annually.**

⇒ **General aviation hours flown are forecast to increase from 32.1M in 2000 to 41.7M in 2012, an average annual growth rate of 2.2% a year.**

- **The hours flown by the turboprop/turbojet fleet is forecast to increase from 4.8M hours in 2000 to 8.7M in 2012, an average annual growth rate of 5.2%**

IV. *FAA WORKLOAD FORECASTS*

Instrument Operations at Combined FAA and Contract Tower Airports

⇒ **Instrument operations are forecast to increase to 54.1M (+2.1%) in 2001, and grow 2.2% a year, reaching 69.2M in 2012.**

- **Commercial instrument operations increase from 28.2M in 2000 to 38.9M in 2012, an average annual growth rate of 2.7%.**

- **General aviation instrument operations increase from 21.3M in 2000 to 26.7M in 2012, an average annual growth rate of 1.9%.**

Aircraft Handled at Air Route Traffic Control Centers

⇒ **IFR aircraft handled at FAA air route traffic control centers increase to 47.0M (+2.2%) in 2001, and grow 2.5% a year, reaching 61.7M in 2012.**

- **Commercial IFR aircraft handled increases from 33.1M in 2000 to 46.5M in 2012, an average annual increase of 2.9%.**

- **General aviation IFR aircraft handled increases from 8.7M in 2000 to 11.0M in 2012, an average annual growth rate of 1.9%.**

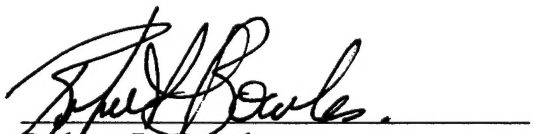
SUPPLEMENTAL TABLES

FOR

FAA AEROSPACE FORECASTS

FISCAL YEARS 2001 – 2012

In the publication *FAA Aerospace Forecasts Fiscal Years 2001 – 2012* a number of risks were highlighted that had the potential to impact the accuracy of the short-term forecasts. Among these risks was slower growth in the U.S. economy. Subsequent to the completion of the forecasts presented in the publication, the Office of Management and Budget (OMB) issued a revised 11-year forecast for the U.S. economy, which projected significantly lower economic growth in 2001. However, the long-term U.S. economic forecasts for 2012 remain basically unchanged. The forecasts presented in these supplemental tables are based on the revised OMB forecasts and reflect FAA's latest outlook for aviation activity and U.S. commercial air carrier traffic. Most of the impact occurred in 2001.



Robert L. Bowles
Manager, Statistics and Forecasts
March 12, 2001

TABLE I-1

ECONOMIC FORECASTS
UNITED STATES AND WORLD
(Revised OMB Outlook--January 22, 2001)
FISCAL YEARS 2001-2012

ECONOMIC VARIABLE	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
UNITED STATES											
Gross Domestic Product--Chain Weighted (BIL 1996$)	7,503.6	8,768.4	9,241.1	9,489.8	9,786.5	13,333.6	4.3	5.4	2.7	3.1	3.1
Consumer Price Index (1982-84 = 100)	151.5	165.6	170.9	175.8	180.3	231.0	2.4	3.2	2.9	2.6	2.5
Oil & Gas Deflator (1996 = 100)	95.2	90.7	117.4	111.6	92.7	105.9	4.3	29.5	(5.0)	(16.9)	(0.9)
INTERNATIONAL											
Gross Domestic Product (In Billions of U.S. 1990$)											
World											
Canada				SAME AS IN FORECAST DOCUMENT							
Europe*											
Latin America/Mexico											
Pacific**											
EXCHANGE RATES											
(U.S.$/Local Currency)											
Canada											
Euro				SAME AS IN FORECAST DOCUMENT							
United Kingdom											
Germany											
Japan***											

Source: United States: FY 1995-2011; Executive Office of the President, Office of Management and Budget
FY 2012; Consensus growth rate of DRI/McGraw-Hill and WEFA, Inc.
International: CY-1995-2012, WEFA, Inc.

* Sum of GDP for Europe, Africa, and Middle East
** Sum of GDP for Japan, Pacific Basin, China, Other Asia, Australia, and New Zealand
*** U.S.$ per 1,000 Yen

TABLE I-4

AVIATION DEMAND FORECASTS AND ASSUMPTIONS
REGIONALS/COMMUTERS
(Revised OMB Outlook--January 22, 2001)
FISCAL YEARS 2001-2012

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT/POINT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
REGIONAL/COMMUTERS											
Enplanements (Millions)	55.8	74.3	79.6	84.1	89.5	154.1	7.4	7.1	5.7	6.4	5.7
298-C Carriers	34.8	36.8	34.8	32.2	34.0	56.1	(0.0)	(5.4)	(7.5)	5.7	4.0
Form 41 Carriers	21.0	37.5	44.7	51.9	55.5	98.0	16.4	19.4	16.0	6.9	6.8
RPMs (Billions)	11.9	18.9	22.3	24.4	26.5	52.2	13.4	18.2	9.3	8.5	7.3
298-C Carriers	7.5	9.3	9.1	8.0	8.7	16.0	3.9	(2.6)	(11.4)	7.8	4.8
Form 41 Carriers	4.4	9.5	13.2	16.3	17.8	36.2	24.5	38.6	23.6	8.9	8.7
Fleet (As of December 31)											
Turboprops	SAME AS IN FORECAST DOCUMENT										
Jets											
Hours Flown (000)	SAME AS IN FORECAST DOCUMENT										
Average Aircraft Size (Seats)											
298-C Carriers	SAME AS IN FORECAST DOCUMENT										
Form 41 Carriers											
Average Trip Length (Miles)											
298-C Carriers	SAME AS IN FORECAST DOCUMENT										
Form 41 Carriers											
Average Load Factor (Percent)											
298-C Carriers	SAME AS IN FORECAST DOCUMENT										
Form 41 Carriers											

Source: Regionals/Commuters; 1995-2000, Forms 298-C and 41, U.S. Department of Transportation; 2001-2012, FAA Forecasts
* Enplanements, RPMs, Fleet, and Hours Flown: annual percent change: all other series, annual absolute change.

TABLE I-2

AVIATION DEMAND FORECASTS
LARGE AIR CARRIERS
(Revised OMB Outlook--January 22, 2001)
FISCAL YEARS 2001-2012

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
U. S./Foreign Flag Carriers											
Total Passengers to/from											
United States (Millions)	104.7	131.3	139.2	146.3	154.5	258.8	5.9	6.0	5.1	5.6	5.3
Atlantic	37.0	48.7	52.7	54.8	57.5	88.7	7.3	8.2	4.0	4.9	4.4
Latin America	32.1	38.8	39.4	41.7	44.5	82.9	4.2	1.7	5.8	6.7	6.4
Pacific	20.8	24.2	26.5	28.3	30.2	54.3	5.0	9.5	6.8	6.7	6.2
Canadian Transborder	14.8	19.7	20.6	21.5	22.3	32.9	6.8	4.6	4.4	3.7	4.0
U.S. Air Carriers											
Enplanements (Millions)											
Domestic	496.3	576.1	604.1	620.7	639.0	927.4	4.0	4.9	2.7	2.9	3.6
International	48.6	53.3	54.6	57.7	61.5	108.4	2.4	2.4	5.8	6.5	5.9
Atlantic	16.2	19.1	20.9	22.0	23.4	37.9	5.2	9.3	5.4	6.2	5.1
Latin America	18.0	21.9	22.5	23.9	25.6	47.8	4.6	2.8	6.4	7.1	6.5
Pacific	14.3	12.3	11.2	11.8	12.5	22.7	(4.8)	(8.9)	5.4	6.0	6.1
System	544.9	629.4	658.7	678.4	700.5	1,035.8	2.1	4.7	3.0	3.3	3.8
RPMs (Billions)											
Domestic	392.6	473.1	502.8	519.4	537.5	822.9	5.1	6.3	3.3	3.5	4.2
International	144.3	169.7	181.3	192.8	206.4	369.6	4.7	6.8	6.4	7.1	6.1
Atlantic	64.4	79.6	87.1	92.2	98.4	163.9	6.2	9.5	5.8	6.7	5.4
Latin America	24.4	34.1	35.8	38.4	41.5	81.8	7.9	4.9	7.3	8.1	7.1
Pacific	55.5	56.1	58.4	62.2	66.5	123.9	1.0	4.2	6.5	6.9	6.5
System	536.9	642.8	684.0	712.2	743.9	1,192.5	5.0	6.4	4.1	4.5	4.7
Cargo RTMs (Billions)											
Domestic	12.4	14.0	14.7	15.0	15.7	25.8	3.4	4.9	2.0	5.1	4.8
International	10.8	14.1	15.3	16.6	17.9	32.8	7.2	8.4	8.6	7.7	6.5
System	23.2	28.1	30.0	31.6	33.6	58.6	5.2	6.7	5.4	6.5	5.7
Fleet (Large Jets Only)											
Passenger				SAME AS IN FORECAST DOCUMENT							
Cargo											
Hours Flown (Millions)*				SAME AS IN FORECAST DOCUMENT							

Source:1995-2000; U.S. Air Carriers, Form 41, U. S. Department of Transportation; Total Passengers, INS Form I-92, U.S. Department of Commerce
2001-2012; FAA Forecasts

* Includes both passenger (excluding regional jets) and cargo aircraft.

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16. Abstract

This report contains the Fiscal Years 2001-2012 Federal Aviation Administration (FAA) forecasts of aviation activity at FAA facilities. These include airports with FAA and contract control towers, air route traffic control centers, and flight service stations. Detailed forecasts were developed for the major users of the National Aviation System--air carriers, air taxi/commuters, general aviation, and military. The forecasts have been prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by State and local authorities, the aviation industry, and the general public.

The outlook for the 12-year forecast period is for moderate economic growth and inflation and declining real fuel prices. Based on these assumptions, aviation activity is forecast to increase by 33.2 percent at the combined FAA (267 in 2000) and contract towered airports (192 in 2000, 221 in 2001) and 34.0 percent at air route traffic control centers. U.S. scheduled domestic passenger enplanements are forecast to increase 53.8 percent--air carriers increasing 53.3 percent and regional/commuters growing by 93.2 percent. Total international passenger traffic between the United States and the rest of the world is projected to increase 91.8 percent. International passenger traffic carried on U.S. flag carriers is forecast to increase 103.3 percent. The general aviation active fleet is forecast to increase by 11.2 percent while general aviation hours flown grow by 29.9 percent.

17. Key Words	18. Distribution Statement		
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PREFACE

I am pleased to submit to the aviation community *FAA Aerospace Forecasts, Fiscal Years 2001-2012*. These forecasts are developed annually by Robert L. Bowles and his staff in the Statistics and Forecast Branch for use by the agency in its planning and decision-making processes. In addition, these forecasts are used extensively throughout the aviation and transportation communities as the industry plans for the future.

This year's report contains ten chapters which discuss four major areas: (1) the U.S. and world economic environment, assumptions, and predictions used in developing the FAA aviation forecasts; (2) historical data and forecasts of future aviation demand and aircraft activity for three major non-military user groups--large commercial air carriers, regional/commuter airlines, and general aviation/helicopters; (3) workload measures for FAA and contracted towers, en route centers, and flight service stations; and (4) the outlook for commercial space transportation. The report concludes with a discussion of our forecast accuracy and year-by-year historical data and forecasts for selected aviation demand and activity series.

Briefly, both U.S. economic activity and aviation demand are predicted to continue expanding at modest rates. Internationally, economic activity and aviation demand are anticipated to grow more rapidly than in the United States, especially in the Pacific/Far East and Latin America.

In reading and using the information contained in this document, it is important to recognize that forecasting is not an exact science. Forecast accuracy is largely dependent on underlying economic and political assumptions. While this always introduces some degree of uncertainty in the short-term, the long-run average trends generally tend to be stable and accurate.

Although there are slight differences between both the Administrations' short- and long-term economic projections and those prepared by other economic forecasting services, the differences are in degree, not direction. However, there are uncertainties and/or risks associated with this year's economic forecasts that could cause the growth in U.S. and world economies to be less than that projected. The domestic and international economic forecasts used in developing this year's forecasts appear to be optimistic, especially with regard to fuel prices and the high rates of growth forecast for the Pacific/Far East and Latin American regions

In addition to economic uncertainty, there are also a number of factors that could cause domestic and international aviation demand and activity at FAA air traffic facilities to be lower than forecast. These factors include the continuing uncertainty with regard to fuel prices, labor unrest and potentially higher labor costs, the possibility of another round of industry consolidation, and continuing air traffic delays at U.S. and world airports.

Future federal policy and programs could also change. Such shifts could produce changes in either the short- and/or long-term economic outlook or both, and could significantly alter the demand for aviation services. Based on the discussions above, it would appear that the greater risk to this year's forecast is on the downside

If in using this document you see opportunities for improvement, I would appreciate hearing from you. We welcome information and suggestions to improve the usefulness and accuracy of our forecasts and this document.

You are also encouraged to send your comments to me at the Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591.

Louise Maillett
Acting Assistant Administrator for Policy,
Planning, and International Aviation

ACKNOWLEDGMENTS

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APO Websites:	
Forecasts/Statistical Publications	http://api.hq.faa.gov/apo_pubs.htm
APO Data System	http://www.apo.data.faa.gov

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2001-2012
Forecasts
U.S. Department of Transportation
Federal Aviation Administration
Office of Aviation Policy & Plans
FAA-APO-01-1
March 2001

CHAPTER I

EXECUTIVE SUMMARY

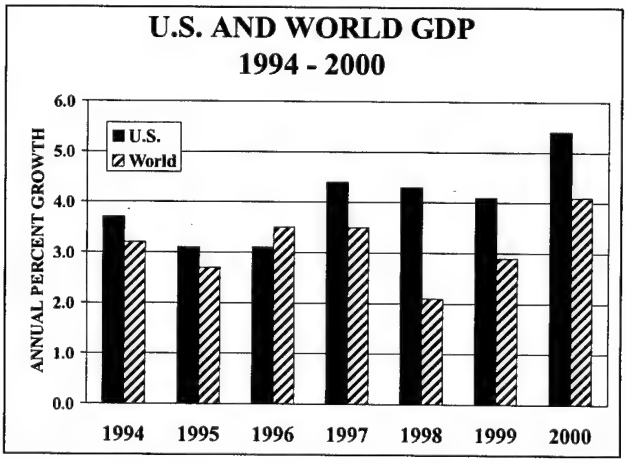
A GREAT START FOR AVIATION IN THE NEW MILLENNIUM!

Amid a year of escalating fuel prices, growing labor unrest, and increasing flight delays at U.S. airports, the U.S. commercial aviation industry recorded its 9th consecutive year of traffic growth and the general aviation industry recorded its 6th consecutive year of increased aircraft shipments and record aircraft billings.

Growth in both domestic and international aviation continues to be driven by the continued economic expansion in the U.S and most world economies. The current U.S. economic expansion, currently the longest in post-war history, is well into its tenth year (38 quarters, dating from 1991:3). U.S. Gross Domestic Product (GDP) growth has averaged 3.6 percent during the current expansion compared to 4.8 percent during the previous longest post-war expansion (35 quarters, from 1961:1 to 1969:3).

In addition, U.S. inflation (as measured by the consumer price index) averaged less than 2.6 percent during the current expansion. The relatively low rate is due, in large part, to a 1.5 percent average annual decline in fuel prices during the 1992-99 time period. However, fuel prices were up 29.5 percent in fiscal year 2000.

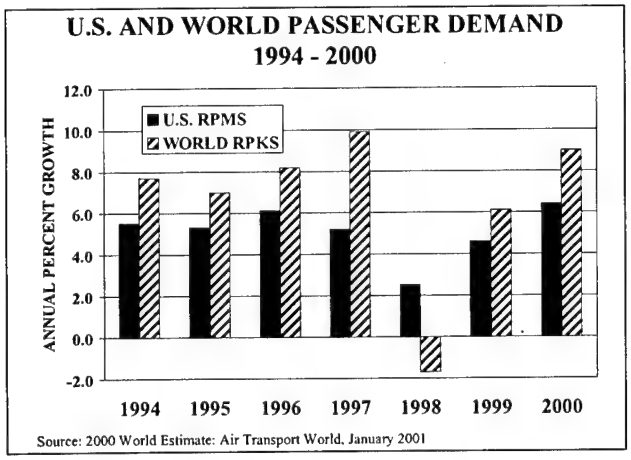
Globally, economic gains have averaged about one percent less (GDP up 2.8 percent) than those of the United States during the current economic expansion. However, the slower rate of world economic growth reflects, to some extent, the impact of the Southeast Asian financial crisis in 1998, when GDP expanded by just over 2.1 percent.



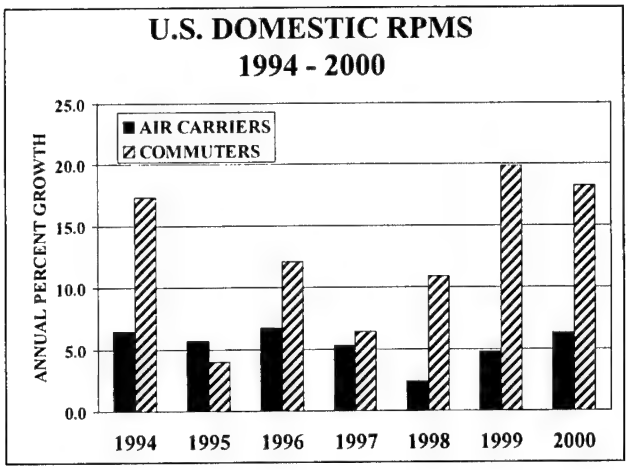
The relatively strong growth in both U.S. and world GDP since 1994 is largely responsible for the strong demand for aviation services, a period marred only by the 1998 Southeast Asia financial crisis which negatively impacted traffic demand in that region. Worldwide passenger demand, as measured by revenue passenger kilometers,

expanded by an average of 6.1 percent over the 1994-1999 time period. During this same period, the number of passengers carried worldwide increased at an average annual rate of 5.3 percent, growing from 1.1 billion in 1993 to almost 1.6 billion in 1999. Although traffic figures are not available for worldwide traffic in 2000, it appears that growth should be in the 6.0 to 8.0 percent range.

U.S. air carrier (sum of large air carriers and regionals/commuters) traffic, as measured by revenue passenger miles (RPMs), has averaged 5.1 percent since 1993. During this same period, the number of passengers carried on U.S. air carriers increased at an average annual rate of 4.3 percent, growing from 515.6 million in 1993 to 693.5 million in 2000. The absolute increase in RPMs during this 7-year period totals over 200 billion. This eclipses the absolute increases of 174 billion and 132 billion achieved during the entire decade of the 1980s and 1970s, respectively.

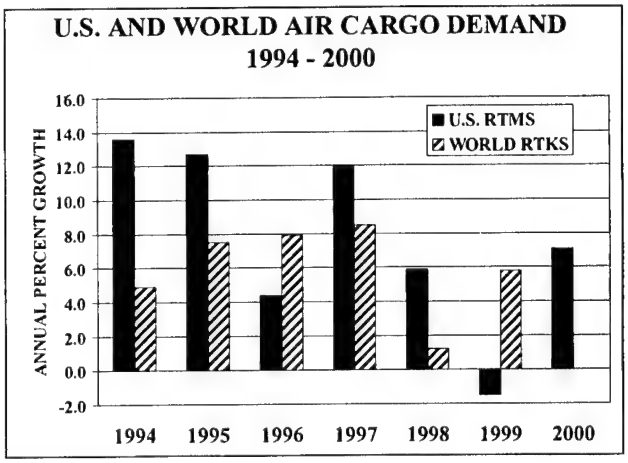


U.S. air carrier domestic RPMs expanded at an annual rate of 5.3 percent between 1993 and 2000 while the number of passenger enplanements increased by 4.5 percent annually. A large part of this growth is attributed to the smaller regional/commuter carriers, whose RPMs and enplanements grew at average annual rates of 12.5 and 7.1 percent compared to 5.1 and 4.1 percent for the larger air carriers.

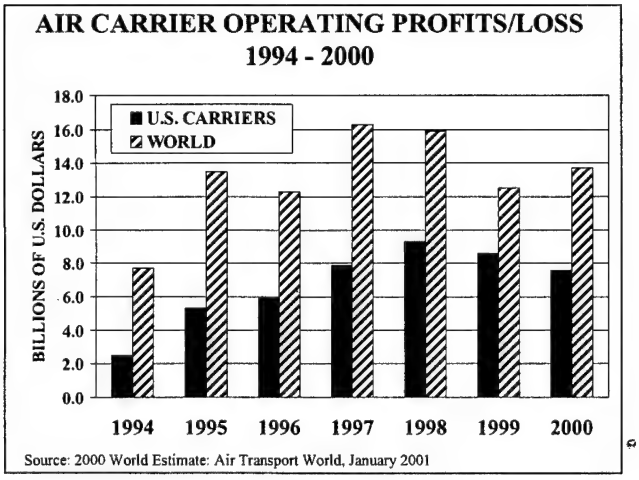


During this same 7-year period, U.S. air carrier international RPM and enplanement growth averaged only 4.3 and 2.7 percent annually, the slower growth due, in large part, to depressed traffic in Asia/Pacific markets--RPMs up 1.5 percent and enplanements down 2.8 percent. Latin American markets' RPMs and enplanements grew by 8.1 and 5.1 percent, respectively, during the same period while growth in Atlantic markets averaged 5.1 and 4.1 percent.

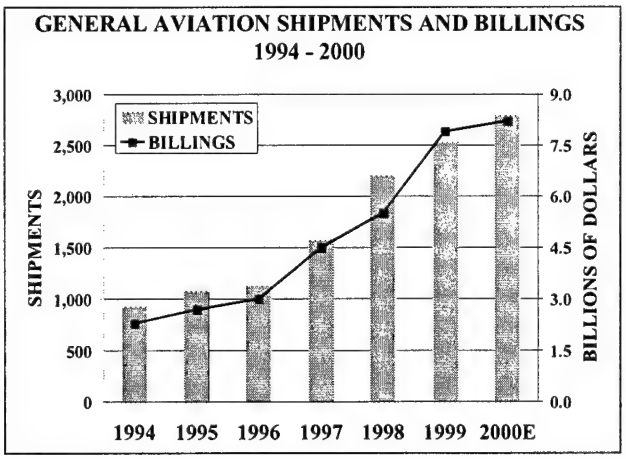
Air cargo demand has grown at a somewhat faster pace than passenger demand since 1993, with worldwide freight revenue ton-kilometers (RTKs) increasing at an annual rate of 6.0 percent over the 1994-1999 period. U.S. air carrier freight revenue ton-miles (RTMs) grew by 7.6 percent annually over the 1994-2000 period, 5.1 percent in domestic markets and 10.1 percent in international markets.



Expanding U.S. and world economic growth, combined with the strong demand for both passenger and air cargo services, have led to record profits for both world and U.S. air carriers. Based on data compiled by the International Civil Aviation Organization (ICAO), world air carriers (including U.S. airlines) reported cumulative operating and net profits totaling $78.2 and $34.0 billion, respectively, over the 6-year period ending in 1999. U.S. air carriers' cumulative operating and net profits totaled $47.2 and $23.7 billion, respectively, over the 7-year period ending in 2000. For U.S. carriers, this is more than double the combined reported profits of the decade of the 1970s ($5.8 billion operating and $3.4 billion net profits) and the 1980s ($11.6 billion operating and $2.6 billion net profits).

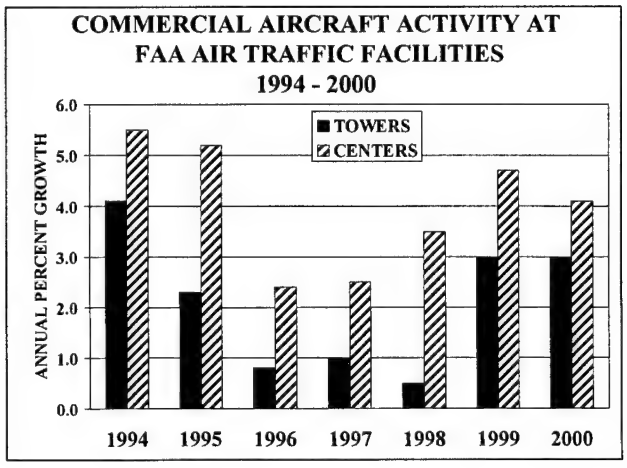


The turnaround in the general aviation industry can be attributed to a combination of two events--the current U.S. economic expansion that began in 1991 and the passage of the General Aviation Revitalization Act in 1994. Based on projections by the Aerospace Industries Association of America, general aviation aircraft shipments are expected to record a 6th consecutive year of increase in 2000 (up 12.0 percent to 2,795) while industry billings are expected to reach a new all-time high of $8.2 billion.[1] General aviation shipments have more than tripled since 1994 while billings have increased almost 5-fold over the same time period.



The FAA's General Aviation and Air Taxi Activity Survey also reports increases in both the general aviation active fleet and hours flown for a 5th consecutive year in 1999. In addition, general aviation activity at FAA air traffic facilities, both itinerant and local operations, continues to perform at levels well above those achieved during the mid-1990s.

The strong growth by both the commercial and general aviation industries during the last 7 years has also expanded the demand for services at FAA air traffic facilities. During this period, activity growth at combined FAA and contract tower airports grew at an average rate of 1.5 percent (IFR activity up 2.1 percent) annually, while activity at en route centers grew at an annual rate of 3.0 percent.



[1] *2000 Year-end Review and 2001 Forecast—An Analysis*, Aerospace Industries Association of America, December 2000

Most of the growth at FAA air traffic facilities has occurred in just the last 4 years. Since 1997, activity at towered airports has increased at an annual rate of 2.6 percent (IFR up 3.0 percent), while activity at en route centers grew by 3.3 percent annually. It is the growth over the past 4 years that has given rise to the delays now occurring at most U.S. commercial airports.

Clearly, the 7-year period since 1993 has indeed been a time of unprecedented growth for both the commercial and general aviation industries. The extremely positive results recorded during this period have assuredly provided the aviation industry with high expectations for continued growth and prosperity throughout the 12-year forecast period.

REVIEW OF 2000

UNITED STATES AND WORLD ECONOMIC ACTIVITY

The U.S. economy expanded by 5.4 percent in 2000, the 4th consecutive recorded increase of 4.0 percent or better. However, inflation was 3.2 percent in 2000, the highest recorded increase in prices since 1991 (up 5.1 percent). In both years, the driving factor behind the relatively high inflation was increased fuel prices, up 11.6 percent in 1991 and 29.5 percent in 2000.

Worldwide economic growth is expected to average 4.4 percent in 2000, the strongest growth achieved since 1976 (up 5.1 percent). Most of this expansion is the result of unprecedented strong growth in the United States and Canada (up 4.7 percent) offsetting somewhat slower growth in European/Africa/Middle East countries (up 3.6 percent). The economies of the Asian/Far East and Latin America countries are expected to expand by 4.4 and 4.3 percent, respectively, in 2000.

COMMERCIAL AVIATION

In 2000, the large U.S. air carriers' system capacity (ASMs or available seat miles) increased by 4.4 percent, only slightly less than the 4.6 percent increase recorded in 1999. Passenger demand (RPMs and enplanements) grew by 6.4 and 4.7 percent, respectively. As a result of faster traffic growth relative to growth in capacity, the system-wide load factor (including domestic and international services) increased to 72.2 percent, an all-time record high. The previous highest system load factor was the 70.9 percent recorded in 1998.

Domestic capacity (50 states, Puerto Rico, and the U.S. Virgin Islands) increased by 4.6 percent in 2000. Domestic capacity is up 10.1 percent over the past 2 years, the highest consecutive year increase recorded since 1986-87 (up 19.5 percent). RPMs and passenger enplanements grew by 6.3 and 4.9 percent, respectively, the result being a 1.1 point increase in load factor to 70.9 percent. This is also an all-time record high, surpassing the previous high of 70.1 percent recorded in 1998.

Traffic growth would have been higher in 2000 except for the "Y2K effect" on traffic. It appears that a relatively large number of travelers avoided travel by air around the first of the year for fear of the Y2K impact on airline safety. In December 1999 and January 2000, domestic passengers were up only 1.5 and 1.7 percent, respectively. International passengers were down 7.0 and 7.1 percent during the same time period. Although some of the lost travel may have been rescheduled for later in the year, it is possible that passenger traffic could have been between 0.5 and 1.0 percent higher.

Regional/commuter airline traffic continued to grow at rates significantly higher than that of the larger air carriers, with RPMs and enplanements up 18.2 and 7.1 percent, respectively. Regionals/commuters capacity increased by

15.3 percent in 2000, the result being a 1.5 point increase in load factor to 59.0 percent—a new all-time high.

In 2000, it is estimated that U.S. and foreign flag carriers combined transported a total of 139.2 million passengers between the United States and the rest of the world, an increase of 6.0 percent over 1999. This traffic volume is distributed among the four world travel markets as follows: 52.7 million (up 8.2 percent) in Atlantic markets; 39.4 million (up 1.7 percent) in Latin American markets; 26.5 million (up 9.5 percent) in Asia/Pacific markets; and 20.6 million (up 4.0 percent) between the United States and Canada.

On the other hand, international enplanements on U.S. flag carriers alone grew by only 2.4 percent in 2000, less than half the estimated growth in total international traffic to and from the United States. U.S. carrier passenger enplanements were up 9.3 percent in Atlantic markets and 2.8 percent in Latin American markets. However, the number of passenger enplanements in Asia/Pacific markets declined by 8.9 percent in 2000, the 3rd consecutive year of declining passenger traffic. During this 3-year period, U.S. air carriers Asia/Pacific enplanements have declined by 29.1 percent while total passengers in the market are up 8.2 percent. While these declines may reflect some loss of market share by U.S. flag carriers, the large decline in U.S. carrier passenger counts is a bit misleading. A large part of the decline is the result of the restructuring and/or elimination of intra-Asia routes by Northwest and United, the two largest U.S. carriers operating in the region. The elimination of the shorter-haul intra-Asia markets also helps to explain the large increase in the average Asia/Pacific passenger trip length (up 1,342 miles) between 1997 and 2000.

U.S. air carriers' air cargo traffic was up 6.7 percent in 2000, with domestic RTMs up 4.9 percent and international RTMs up 8.4 percent. This represents a significant turnaround from 1999 when cargo traffic declined 0.9 percent, the first recorded decline since 1985. The decline in 1999 was largely due to a 2.7 percent decline in international cargo traffic, in particular freight movements between the U.S. and Latin American and Asian markets. It appears that these markets have turned around in 2000.

Domestic freight/express RTMs (12.1 billion) were up 5.3 percent while domestic mail RTMs (2.5 billion) were up 3.2 percent over 1999 levels. International freight/express (14.8 billion) and mail (531.9 million) RTMs were up 8.6 and 4.4 percent, respectively, in 2000.

Industry operating and net profits totaled $7.6 and $3.6 billion, respectively in 2000. This represents declines of $1.1 billion in operating profits and $1.7 billion in net profits from 1999. Operating revenues were up 8.3 percent in 2000, due to a combination of strong traffic growth and a 3.5 percent increase in passenger yield. Operating expenses were up 10.0 percent, due, in large part, to a 48.0 percent increase in the price of jet fuel--from 49.69 to 73.83 cents per gallon. The run-up in oil prices is estimated to have increased industry operating expenses by over $4.8 billion in 2000.

The impact of higher fuel prices on individual carrier' profits varied considerably, largely depending on the percentage of fuel requirements that each carrier was able to hedge at lower-than-market costs. Generally, the larger air carriers were more favorably impacted by use of these fuel-hedging strategies. For example, in September 2000 domestic jet fuel prices averaged 89.98 cents per gallon. However, the average price paid for jet fuel ranged from a low of 67.51 cents by American Airlines to a high of $1.91 per gallon by Tatonduk, a cargo carrier in Alaska.

In general, hedging appears to have further heightened the disparity that exists among the individual U.S. carriers with regard to financial profitability and/or viability. In 2000, all but two

of the 15 majors[2] reported positive earnings, with operating and net profits for the group totaling $7.3 and $3.7 billion, respectively. Operating results for the majors ranged from a high of $1.4 billion (American) to a loss of $364.1 million (Trans World). Three carriers (American, Delta, and United) accounted for over half (54.1 percent) of the group's total earnings. Not surprisingly, these three carriers were among the leaders in the percentage of fuel hedged in 2000.

The financial results of many of the smaller nationals[3] and regionals[4] worsened in 2000, with 22 of the 53 reporting carriers incurring operating losses. The combined operating profits of the nationals and regionals totaled just under $500 million in 2000, with earnings ranging from an operating profit of $220 million (Atlas Airlines) to an operating loss of nearly $51 million (Vanguard Airlines).

A number of the smaller carriers cited the burden of escalating fuel prices and the lack of hedging protection as major factors for their poor financial performance in 2000. The record for the low cost, low-fare, new entrant carriers was mixed in 2000, with several of the carriers posting large operating losses. Since December 1999, a total of 10 carriers have filed Chapter 11 bankruptcy, including several startup carriers.

The regional/commuter airline industry posted an operating profit of $546.2 million in 2000, $162.4 million less than the $708.6 million profit recorded in 1999. The nine Form 41 carriers (operating at least one aircraft with more than 60 seats) reported operating profits of $341.4 million while 81 Form 298-C carriers (operating only aircraft with 60 seats or less) posted profits of $204.8 million. The lower profits reflect the significantly higher fuel prices in 2000.

Orders for commercial jet aircraft totaled 1,450 during the first 3 quarters of 2000, a 54.7 percent increase over the same period in 1999. The smaller regional jets (37 to 70 seats) accounted for 45.6 percent of the orders (661 aircraft) during 2000, a 51.6 percent increase over the 436 aircraft ordered during the first 9 months of 1999. While the total number of jets in the U.S. regional/commuter fleet totaled only 569 in 2000 (547 defined as regional jets), the 1,582 orders over the past 11 quarters show that this will continue to be the fastest growing segment of the industry over the next several years.

A total of 788 commercial jet aircraft were delivered during the first 3 quarters of 2000, a slight decline from the same 1999 period. A total of 206 regional jets were delivered during the first 9 months of 2000, a 53.7 percent increase over deliveries during the same 1999 period.

GENERAL AVIATION

By any measure, 2000 was another very good year for general aviation. Unit shipments of general aviation aircraft are well on their way to recording a sixth consecutive year of increase. General aviation manufacturers' shipments increased from 928 aircraft in 1994 to 2,525 aircraft in 1999 (up 172 percent) and were up an additional 16.3 percent (2,000 units) during the first 3 quarters of 2000. Of particular importance is the renewed interest in piston powered aircraft. Shipments of piston powered aircraft have more than tripled between 1994 and 1999 (from 499 to 1,747) and were up an additional 13.8 percent (1,336 units) during the first 9 months of 2000.

Shipments of jet aircraft have increased in each of the past 7 years (from 171 in 1992 to 514 in 1999) and are headed toward an 8th consecutive

[2] Defined by the U.S. DOT as carriers with annual operating revenues greater than $1 billion.

[3] Defined by the U.S. DOT as carriers with annual operating revenues between $100 million and $1 billion.

[4] Defined by the U.S. DOT as carriers with annual operating revenue less than $100 million.

year of increase (352 units, up 15.1 percent) through the first 3 quarters of 2000. The increased sales of jet aircraft reflects, to a large extent, the relative importance of the rapidly growing fractional ownership programs to the industry's current turnaround and its future growth. While shipments of turboprop aircraft (down 2.6 percent in 1999) have not fared as well as the other two aircraft categories, shipments totaled 233 (up 36.3 percent) during the first 9 months of 2000.

Billings for general aviation aircraft totaled almost $7.9 billion in 1999--an all-time record high. During the first 9 months of 2000, the industry reported billings of almost $6.3 billion, up 10.4 percent over the same time period in 1999. The larger increase in shipments relative to billings reflects increased shipments of the lower unit-priced piston aircraft. The export market for general aviation aircraft has been a mixed bag so far in 2000. Export shipments were up 11.3 percent during the first 3 quarters of the year. However, billings declined 20.7 percent over the same time period.

Based on the results of the 1999 General Aviation and Air Taxi Activity and Avionics Survey, the active general aviation aircraft fleet and hours flown both increased for a 5th consecutive year, up 7.2 and 13.0 percent, respectively. According to the 1999 survey, the active general aviation fleet totaled 219,464 and flew an estimated 31.8 million hours.

General aviation activity counts at FAA air traffic facilities were mixed in 2000, possibly reflecting the increased price of aviation fuels. In September, the price of jet-A ranged between $2.31 and $2.60 per gallon while the price of avgas ranged between $2.35 and $2.82 per gallon. Operations at combined FAA and contract towers declined 0.5 percent, with itinerant operations down 0.8 percent and local operations basically unchanged from 1999. Conversely, instrument operations at the combined towered airports increased for a 4th fourth consecutive year, up 1.9 percent in 2000 and 17.8 percent over the last 4 years.

After recording increased activity for 8 consecutive years (up 20.3 percent between 1992 and 1999), general aviation activity at FAA en route centers declined by 0.7 percent in 2000. Despite a decline in the number of general aviation aircraft handled in 2000, there were some positive trends that reflect continuing growth in business and corporate flying. Although domestic departures recorded at FAA en route centers were down 1.7 percent, oceanic departures were up 40.4 percent. Additionally, both domestic and oceanic overs at FAA en route centers showed positive gains in 2000, up 2.5 and 16.2 percent, respectively.

Although local operations (generally touch-and-go activity) at FAA and contract towered airports remained unchanged in 2000, local activity was up 17.4 percent during the prior 3 years. If fuel prices decline as projected, we can expect the turnaround exhibited in recreational and instructional flying over the previous several years to resume once again.

The number of active pilots are estimated to have increased for a 3rd consecutive year in 2000, totaling 645,539. All four of the major pilot categories are estimated to have increased in 2000--student, private, commercial, and airline transport. The number of instrument rated pilots was estimated to increase by nearly 6,000 to 315,100 in 2000, also the 3rd consecutive year of increased numbers.

Although most of the statistics relating to general aviation activity are encouraging, it is the numbers relating to student pilots, one of the key factors impacting the future of the general aviation industry, that are of particular importance to the general aviation industry. The industry has, over the past several years, instituted a number of industry-wide programs, including "BE A PILOT," which are designed to attract new pilots to general aviation. The future

direction of the industry will depend, in large part, on the success of these programs.

FAA WORKLOAD

At the end of fiscal year 2000, there were a total of 459 towered airports--267 FAA towers and 192 FAA contract towers. This compares to 402 FAA towers and 33 contract towers in 1994, the year that the FAA began an extensive conversion of Level 1 towers.

In 2000, FAA contract towers accounted for 22.6 percent of the total combined activity at the 459 towers, up from only 3.0 percent in 1994. As in 1994, the majority of traffic activity at contract towers is performed by general aviation aircraft--83.0 percent in 2000 compared to 82.8 percent in 1984.

FAA and Contract Towers

The combined activity counts at FAA and contract towers totaled 68.7 million in 2000, an increase of 0.8 percent over 1999. The relatively slow growth in the tower counts was, in large part, due to declines in both general aviation and military activity. General aviation operations declined 0.5 percent while military activity was down 1.2 percent. Commercial operations (the sum of air carrier and commuter/air taxi) totaled 25.9 million, an increase of 3.1 percent. Air carrier operations grew by 3.9 percent while commuter/air taxi operations increased by 1.7 percent.

Air carrier counts were negatively impacted during the summer months by the labor unrest at United Airlines. It is estimated that United cancelled a total of 15,000 flights (30,000 operations) during the June to September period.

Activity at FAA air traffic control towers totaled 53.2 million in 2000, a decline of 3.4 percent from 1999 activity levels. Operations at contract towers totaled 15.5 million, an increase of 18.6 percent.

Instrument operations at the combined FAA and contract towers totaled 53.0 million in 2000, an increase of 2.3 percent. General aviation activity was up 1.8 percent while military activity grew by 1.6 percent. Commercial activity expanded by 2.7 percent in 2000, with air carriers up 4.4 percent and commuters/air taxis up 0.3 percent. Instrument activity at FAA towered airports (98.4 percent of total combined operations) were also up 2.0 percent in 2000, while instrument operations at contract towers increased 17.4 percent.

FAA En Route Centers

The number of Instrument Flight Rule (IFR) aircraft handled at FAA's en route air traffic control centers totaled 46.0 million in 2000, an increase of 3.1 percent over 1999. The number of commercial and military aircraft handled were up 4.1 and 3.0 percent, respectively. General aviation activity declined 0.7 percent in 2000.

FAA Flight Service Stations

The number of traditional (non-automated) services provided at FAA Flight Service Stations (FSS) totaled 30.5 million in 2000, a 5.9 percent decline from 1999 levels. All categories of flight services declined in 2000: pilot briefings, down 7.2 percent; aircraft contacted, down 3.0 percent; and flight plans originated, down 5.1 percent.

The Direct User Access Terminal System (DUATS) provides an automated alternative to the FSS for obtaining pilot briefing information and filing flight plans. The number of weighted

DUATS services totaled 15.0 million (up 7.9 percent) in 2000. Combined FSS and DUATS services totaled 45.5 million in 2000, a decline of 2.4 percent from the number of combined transactions recorded in 1999.

FAA AEROSPACE FORECASTS FISCAL YEARS 2001 - 2012

Relatively few additions or format changes have been made to this year's FAA aviation forecast document. The changes made are relatively minor and occur mainly in Chapter IV, Regionals/ Commuters, and in Forecasts Tables 23-26 (Chapter X), which pertain to that segment of the aviation industry.

Several adjustments were made to the regional/commuter historical database to correct for understated traffic. Carriers reporting on DOT Form 298-C are only required to report originating passengers and not enplanements, which includes both originating passengers as well as connecting passengers. With the increased hubbing activities of ComAir and Atlantic Coast, this resulted in an understatement of almost 1.9 million passengers (2.5 percent) in 1999. Additionally, the "wet leasing" arrangement between Chicago Express and American Trans Air resulted in all of regional carrier's traffic being reported as air carrier. Adjustments were made for the period 1997-2000 to correct for these undercounts of regional/commuter passengers.

In addition, a one-time analysis of 10 years of the regional/commuter carrier's Official Airline Guide schedules (1991-2000) is included as part of the discussion in Chapter IV. The purpose of the analysis was to assess the impact that regional jets have had on the regional/commuter industry since their introduction in 1993.

Other changes include the addition of regional/commuter passenger yield and available seat mile data to the regional/commuter forecast tables contained in Chapter X.

For a 3rd year, the document contains a chapter on commercial space transportation prepared in conjunction with the staff of the FAA's Commercial Space Transportation Office. This chapter is intended to provide an overview of the state of the space transportation and includes forecasts of expected commercial launches over the next several years. The forecasts and discussion can be found in Chapter IX.

ECONOMIC FORECASTS

The economic forecasts used by the FAA to project domestic aviation demand are provided by the Executive Office of the President, Office of Management and Budget (OMB). In addition to the OMB forecasts, the FAA also uses the U.S. macro economic projections of two commercial forecasting services--DRI/McGraw Hill (DRI) and WEFA, Inc. (WEFA). These alternative forecasts provide the FAA with a range of economic forecasts with which to gauge the risk associated with variations from the OMB projections. The FAA uses the world and individual country economic projections provided by WEFA to forecast the demand for international aviation services.

In any given year there are likely to be variations around the long-term trend. None of the current economic models used by the FAA are sufficiently precise to predict interim business cycles. In addition, unanticipated developments, such as the 1997-98 Southeast Asia financial crisis, the 1998 Northwest Airlines' strike, or United Airlines' labor problems during the summer of 2000 cannot be predicted.

In addition to the economic forecasts prepared by OMB and the economic forecasting services, the FAA incorporates many of the relevant assumptions developed at the September 1999 FAA/TRB Future Aviation Activities 11th International Workshop. Although the FAA makes use of the recommendations and assumptions developed for both the commercial and general aviation industries, it relies heavily on the assumptions and forecasts prepared by the three industry panels on general aviation--Light General Aviation, Business Aviation, and Vertical Flight--in preparing its general aviation and helicopter forecasts. The 12th FAA/TRB Workshop is scheduled to be held in Washington, D.C. on September 12-14, 2001.

The projected growth of aviation demand discussed in this and subsequent chapters is consistent with the national short- and long-term economic growth forecasts discussed in greater detail in Chapter II. Table I-1 (page I-11) summarizes the key U.S. and world economic assumptions used in developing the domestic and international aviation demand forecasts. Annual historical data and economic forecasts are presented in tabular form in Chapter X, Tables 1 through 5.

United States Economy

While there is basic agreement among most economic forecasters as to the general direction of the U.S. economy--sustained growth--there are significant differences among the economic projections supplied by OMB, DRI, and WEFA, especially during the 2002-2005 time period. The two economic forecasting services are both considerably more optimistic than OMB with regard to economic growth during this period, averaging 3.7 percent annual growth compared to only 3.2 percent for OMB.

The OMB economic forecasts anticipate moderate growth throughout the forecast period. In the short-term, U.S. real GDP is projected to increase by 3.5 percent in 2001, then slowing to average growth of 3.2 percent over the next 5 years. GDP is forecast to increase at an average annual growth rate of 3.1 percent over the entire 12-year forecast period. The consumer price index is projected to remain in the moderate range throughout the 12-year forecast period, increasing at an average annual rate of 2.7 percent.

The oil and gas deflator, which was up 29.5 percent in 2000, is projected to increase by only 1.2 percent in 2001, then decline by almost 24.0 percent over the next 2 years. Starting in 2004, oil prices resume a more moderate upward trend, increasing by an average 2.0 percent over the remaining 9 years of the forecast period. Fuel prices are forecast to decline at an average annual rate of 0.6 percent over the entire 12-year forecast period, the result being a 3.3 annual decline in real fuel prices.

No major disruptions in the price or availability of oil have been assumed during the 12-year forecast period.

World Economy

Worldwide economic growth is expected to exceed that of the United States by approximately 0.3 percent annually over the 12-year forecast period, increasing at an average annual rate of 3.4 percent. Economic growth is forecast to be greatest in the Asia/Pacific and Latin America regions, expanding at annual rates of 4.6 and 4.4 percent, respectively. These high rates of growth assume that the two regions have fully recovered from the impacts of Southeast Asian and Brazilian financial crises. Economic growth in the Europe/Africa/Middle East countries and Canada are expected to average 2.8 and 2.7 percent, respectively, over the forecast period.

TABLE I-1

ECONOMIC FORECASTS
UNITED STATES AND WORLD

FISCAL YEARS 2001-2012

ECONOMIC VARIABLE	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
UNITED STATES											
Gross Domestic Product--Chain Weighted (BIL 1996$)	7,503.6	8,768.4	9,244.2	9,569.3	9,875.5	13,321.2	4.3	5.4	3.5	3.2	3.1
Consumer Price Index (1982-84 = 100)	151.5	165.6	170.9	175.8	180.2	235.1	2.4	3.2	2.9	2.5	2.7
Oil & Gas Deflator (1996 = 100)	95.2	90.7	117.4	118.9	97.6	108.8	4.3	29.5	1.2	(17.9)	(0.6)
INTERNATIONAL											
Gross Domestic Product (In Billions of U.S. 1990$)											
World	23,558.5	26,528.1	27,687.6	28,736.9	29,773.7	41,550.1	3.3	4.4	3.8	3.6	3.4
Canada	633.7	725.3	759.4	783.8	807.4	1,046.5	3.7	4.7	3.2	3.0	2.7
Europe*	8,965.8	9,842.2	10,196.3	10,535.4	10,842.3	14,212.4	2.6	3.6	3.3	2.9	2.8
Latin America/Mexico	1,215.6	1,357.6	1,417.3	1,480.8	1,548.4	2,369.3	3.1	4.4	4.5	4.6	4.4
Pacific**	5,845.2	6,563.4	6,847.5	7,159.1	7,493.2	11,717.8	3.2	4.3	4.6	4.7	4.6
EXCHANGE RATES											
(U.S.$/Local Currency)											
Canada	0.729	0.673	0.680	0.683	0.693	0.744	(1.4)	1.0	0.4	1.5	0.8
Euro	NA	1.065	0.914	0.895	1.007	1.170	NA	(14.2)	(2.1)	12.5	2.1
United Kingdom	1.578	1.617	1.540	1.595	1.606	1.651	(0.5)	(4.8)	3.6	0.7	0.6
Germany	0.698	0.545	0.464	0.457	0.515	0.598	(7.8)	(14.9)	(1.5)	12.7	2.1
Japan***	10.632	8.782	9.402	9.443	9.496	10.612	(2.4)	7.1	0.4	0.6	1.0

Source: United States: FY 1995-2011; Executive Office of the President, Office of Management and Budget
FY 2012; Consensus growth rate of DRI/McGraw-Hill and WEFA, Inc.
International: CY-1995-2012, WEFA, Inc.

* Sum of GDP for Europe, Africa, and Middle East
** Sum of GDP for Japan, Pacific Basin, China, Other Asia, Australia, and New Zealand
*** U.S.$ per 1,000 Yen

AVIATION TRAFFIC AND ACTIVITY FORECASTS

The large commercial air carrier traffic and activity forecasts are summarized in Table I-2 (page I-13), the forecast assumptions in Table I-3 (page I-14). A detailed discussion of the forecasts and underlying assumptions can be found in Chapter III. Year-to-year historical data and forecasts can be found in Chapter X, Tables 6 through 22.

The regional/commuter forecasts and assumptions are summarized in Table I-4 (page I-17). The general aviation forecasts are summarized in Table I-5 (page I-19). Detailed discussions of the forecasts and underlying assumptions for the regionals/ commuters can be found in Chapter 4; general aviation in Chapter V. Year-to-year historical data and forecasts can be found in Chapter X--Tables 23 through 26 for regionals/commuters and Tables 27 through 31 for general aviation.

Commercial Aviation

Domestic Air Carrier Passenger Traffic

Domestic air carrier RPMs and passenger enplanements are forecast to increase at annual rates of 4.2 and 3.6 percent, respectively, over the 12-year forecast period. The forecast assumes that domestic RPMs and enplanements will grow by 3.9 and 3.3 percent, respectively, in 2001, then slow marginally in 2002, growing by 3.6 and 3.0 percent, respectively. U.S. carriers are expected to achieve somewhat higher growth beginning in 2003, with RPMs and enplanements averaging 4.3 and 3.7 percent over the remainder of the forecast period.

Higher passenger yields are expected to impact domestic traffic demand in the short-term. Domestic passenger yields are expected to increase by 2.9 and 2.4 percent during the first 2 years of the forecast period (basically flat in real terms), due in part to higher fuel costs in 2001 and expected higher labor costs in both years. Yield increases moderate thereafter, averaging 0.9 percent over the remaining 10 years of the forecast period. Real yields decline by an average 1.7 percent during the same 10-year period.

The relatively large decline in real yields over the latter years of the forecast is based on the assumption that increased competitive pressures (both domestically and internationally) will force carriers to hold the line on fare increases. Competition in domestic markets will come from established low-fare carriers such as Southwest; as well as from low cost carriers, such as Frontier and JetBlue. Internationally, increased competition will come from expanded open sky agreements and new and existing global alliances. Additionally, the expanded use of electronic ticketing should continue to reduce the costs associated with this marketing/distribution function. There should also be considerably less pressure exerted on operating costs from rising oil prices throughout the forecast period

Air carrier aircraft operations are forecast to increase at an annual rate of 3.1 percent during the 12-year forecast period. The slower growth in activity at FAA air traffic facilities relative to expected traffic increases (3.6 percent growth in domestic enplanements) reflects the efficiencies which result from the assumed increases in both domestic average aircraft size (up 0.7 seats annually) and the passenger trip length (up 4.6 miles annually). However, very little gain is expected to result from increased domestic passenger load factors. The current forecast assumes that load factors will decline gradually from 70.9 percent in 2000 to 70.0 percent in 2003, then resume its upward trend and average 70.5 percent for most of the remaining years of the forecast period.

TABLE I-2

AVIATION DEMAND FORECASTS
LARGE AIR CARRIERS

FISCAL YEARS 2001-2012

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
U. S./Foreign Flag Carriers											
Total Passengers to/from											
United States (Millions)	104.7	131.3	139.2	147.3	156.2	267.0	5.9	6.0	5.8	6.0	5.6
Atlantic	37.0	48.7	52.7	55.4	58.5	93.2	7.3	8.2	5.1	5.6	4.9
Latin America	32.1	38.8	39.4	42.0	45.0	86.2	4.2	1.7	6.6	7.1	6.7
Pacific	20.8	24.2	26.5	28.4	30.3	54.7	5.0	9.5	7.2	6.7	6.2
Canadian Transborder	14.8	19.7	20.6	21.5	22.3	32.9	6.8	4.6	4.4	3.7	4.0
U.S. Air Carriers											
Enplanements (Millions)											
Domestic	496.3	576.1	604.1	624.3	643.3	926.6	4.0	4.9	3.3	3.0	3.6
International	48.6	53.3	54.6	58.1	62.1	111.0	2.4	2.4	6.5	6.8	6.1
Atlantic	16.2	19.1	20.9	22.2	23.6	38.4	5.2	9.3	6.1	6.3	5.2
Latin America	18.0	21.9	22.5	24.1	25.9	49.7	4.6	2.8	7.2	7.6	6.8
Pacific	14.3	12.3	11.2	11.8	12.5	23.0	(4.8)	(8.9)	5.7	6.1	6.2
System	544.9	629.4	658.7	682.4	705.4	1,037.6	2.1	4.7	3.6	3.4	3.9
RPMs (Billions)											
Domestic	392.6	473.1	502.8	522.4	541.2	822.1	5.1	6.3	3.9	3.6	4.2
International	144.3	169.7	181.3	194.0	207.9	376.0	4.7	6.8	7.0	7.2	6.3
Atlantic	64.4	79.6	87.1	92.9	99.2	165.9	6.2	9.5	6.6	6.8	5.5
Latin America	24.4	34.1	35.8	38.7	42.0	85.0	7.9	4.9	8.1	8.5	7.5
Pacific	55.5	56.1	58.4	62.4	66.7	125.1	1.0	4.2	6.9	6.9	6.6
System	536.9	642.8	684.0	716.4	749.1	1,198.1	5.0	6.4	4.7	4.6	4.8
Cargo RTMs (Billions)											
Domestic	12.4	14.0	14.7	15.5	16.3	26.3	3.4	4.9	5.7	5.2	5.0
International	10.8	14.1	15.3	16.6	17.9	32.8	7.2	8.4	8.6	7.7	6.5
System	23.2	28.1	30.0	32.1	34.2	59.1	5.2	6.7	7.2	6.5	5.8
Fleet (Large Jets Only)	4,721	5,319	5,490	5,567	5,714	8,073	3.1	3.2	1.4	2.6	3.3
Passenger	3,897	4,290	4,417	4,468	4,562	6,313	2.5	3.0	1.2	2.1	3.0
Cargo	824	1,029	1,073	1,099	1,152	1,760	5.4	4.3	2.4	4.8	4.2
Hours Flown (Millions)*	12.0	13.7	14.4	14.7	15.3	22.7	3.7	4.9	2.3	3.9	3.9

Source:1995-2000; U.S. Air Carriers, Form 41, U. S. Department of Transportation; Total Passengers, INS Form I-92, U.S. Department of Commerce
2001-2012; FAA Forecasts

* Includes both passenger (excluding regional jets) and cargo aircraft.

TABLE I-3

AVIATION FORECAST ASSUMPTIONS
LARGE AIR CARRIERS

FISCAL YEARS 2001-2012

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT/POINT* AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
Large Air Carriers											
Passenger Yields (Cents/RPM)											
(In Current Dollars)											
Domestic	13.31	13.97	14.42	14.84	15.19	16.68	1.6	3.2	2.9	2.4	1.2
International	11.17	10.04	10.50	10.59	10.70	13.04	(1.2)	4.6	0.9	1.0	1.8
Atlantic	9.88	9.61	9.72	9.75	9.80	11.85	(0.3)	1.1	0.3	0.5	1.7
Latin America	13.70	12.76	13.21	13.25	13.31	16.35	(0.7)	3.5	0.3	0.5	1.8
Pacific	11.55	9.00	9.99	10.21	10.41	12.38	(2.9)	11.0	2.2	2.0	1.8
Average Aircraft Size (Seats)											
Domestic	143.4	141.3	139.3	139.0	139.4	147.4	(0.8)	(2.0)	(0.3)	0.4	0.7
International	247.6	232.4	234.1	234.5	235.4	248.2	(2.7)	1.7	0.4	0.9	1.2
Atlantic	238.2	229.6	233.7	234.7	235.7	250.7	(0.9)	4.1	1.0	1.0	1.4
Latin America	180.1	176.6	173.5	174.0	175.0	185.0	(1.3)	(3.1)	0.5	1.0	1.0
Pacific	322.0	303.8	308.0	308.0	311.0	331.0	(2.8)	4.2	0.0	3.0	1.9
Average Trip Length (Miles)											
Domestic	791.0	821.1	832.3	836.8	841.3	887.3	8.3	11.2	4.5	4.5	4.6
International	2,973.0	3,185.6	3,321.9	3,338.9	3,350.3	3,386.0	69.8	136.3	17.0	11.4	5.3
Atlantic	3,966.1	4,161.9	4,168.3	4,187.9	4,207.3	4,322.3	40.4	6.4	19.6	19.4	12.8
Latin America	1,358.9	1,559.1	1,591.7	1,606.7	1,620.2	1,710.7	46.6	32.6	15.0	13.5	9.9
Pacific	3,872.4	4,563.7	5,219.9	5,279.9	5,319.9	5,449.9	269.5	656.2	60.0	40.0	19.2
Average Load Factor (Percent)											
Domestic	65.2	69.8	70.9	70.5	70.2	70.5	1.1	1.1	(0.4)	(0.3)	(0.0)
International	71.4	73.9	76.0	75.3	75.5	76.3	0.9	2.1	(0.7)	0.2	0.0
Atlantic	75.0	77.5	79.2	78.7	79.2	80.0	0.8	1.7	(0.5)	0.5	0.1
Latin America	63.0	65.9	68.8	68.0	67.5	68.5	1.2	2.9	(0.8)	(0.5)	(0.0)
Pacific	71.5	74.5	76.2	75.5	76.0	77.5	0.9	1.7	(0.7)	0.5	0.1

Source:1995-2000; U.S. Air Carriers, Form 41, U. S. Department of Transportation; Total Passengers, INS Form I-92, U.S. Department of Commerce
2001-2012; FAA Forecasts

* Passenger Yield, annual percent change; all other series, annual absolute change.

International Air Carrier Passenger Traffic

Forecasts of total passenger traffic (sum of U.S. and foreign flag carriers) are provided between the United States and three world travel areas--Atlantic, Latin America (including Mexico and the Caribbean), and the Asia/Pacific--as well as for U.S./Canadian transborder traffic. These forecasts are based on historical passenger statistics obtained from the United States Immigration and Naturalization Services (INS) and Transport Canada, and on regional world historical data and economic projections obtained from WEFA.

Total passenger traffic between the United States and the rest of the world is expected to grow from 139.2 million in 2000 to 267.0 million in 2012, an average annual growth rate of 5.6 percent. Passenger traffic is expected to be strongest in Latin American and Pacific markets, growing at annual rates of 6.7 and 6.2 percent, respectively, over the forecast period. Passenger traffic is projected to grow 4.9 percent annually in Atlantic markets and 4.0 percent a year in Canadian markets.

U.S. air carrier international RPMs and passenger enplanements are forecast to increase at average annual rates of 6.3 and 6.1 percent respectively, over the 12-year forecast period. The stronger growth in international travel relative to domestic markets is being driven by the strong passenger demand projected in the Latin America and Asia/Pacific markets—up 6.8 and 6.2 percent, respectively. U.S. air carrier international RPMs and enplanements are expected to be especially strong during the first 2 years of the forecast period, averaging 7.1 and 6.6 percent, respectively. The strong growth in international traffic in 2001 and 2002 is also being driven by the strong demand in the Latin America and Asia/Pacific markets. Latin American RPMs and enplanements are projected to grow an average 8.3 and 7.4 percent over the 2 years while Asia/Pacific markets average 6.9 and 5.9 percent. The Atlantic markets are also expected to continue to exhibit relatively strong growth during this 2-year period, with RPMs growing by an average 6.7 percent and enplanements growing by an average 6.2 percent.

The air carrier forecasts assume that commercial air carriers will continue to benefit from the strong economic growth expected to take place both within the United States and worldwide. It is also assumed that electronic technology improvements, along with a continuation of cost containment efforts, will benefit the overall financial performance of both U.S. and foreign flag carriers. In addition, the operation of a fleet consisting entirely of more fuel-efficient stage-3 aircraft should result in further cost savings and increased industry productivity. These productivity improvements should strengthen the industry's overall financial performance.

Regionals/Commuters Passenger Traffic

The regional/commuter industry consists of carriers that report on DOT Form 298-C (81 carriers in 2000) and DOT Form-41 (9 carriers in 2000). For reporting purposes, the designation is based on aircraft size--carriers operating one aircraft with more than 60 seats report all traffic, whether transported on larger or smaller aircraft, on DOT Form 41. All other carriers report on DOT Form 298-C.

In 2000, the regional/commuter airlines enplaned 79.6 million passengers, 12.5 percent of all passenger traffic in scheduled domestic air service. By the year 2012, these carriers are expected to carry 153.7 million passengers (5.6 percent annual growth) and to account for 15.6 percent of all domestic passenger enplanements.

Regional/commuter airlines RPMs are expected to increase by 7.3 percent annually over the forecast period, growing from 22.3 billion in 2000 to 52.1 billion in 2012. Most of the growth in regional/commuter traffic is expected to occur among the Form 41 carriers (RPMs and enplanements up 8.7 and 6.7 percent, respectively) or from the larger Form 298-C carriers who operate the new regional jets.

The significantly higher growth in RPMs relative to enplanements is the result of expected large increases in the average passenger trip length for regional/commuter carriers, increasing from 280.4 miles in 2000 to 338.8 miles in 2012. This increase in trip length is due to the continued integration of large numbers of regional jets (1,617 over the 12-year forecast period) and high-speed turboprops into the regional/commuter fleets. These aircraft, with ranges of up to 1,000 miles, are expected to open up numerous new opportunities for growth in non-traditional regional/commuter markets. The increased use of regional jets is also expected to lead to further route rationalization by the larger commercial air carriers, including markets in the 400 to 500 mile range and beyond. This phenomenon is expected to be one of the drivers of growth for the regional/commuter carriers during the first half of the forecast period.

The move to greater use of regional jets and larger propeller-driven aircraft results in the average seating capacity of the regional fleet increasing from 37.5 seats in 2000 to 46.0 seats in 2012. Most of the growth in aircraft seat size occurs among the larger Form 41 carriers whose average aircraft seat size increases to 53.0 seats in 2012, up from 44.9 seats in 2000. Form 298-C carriers' average aircraft seat size increases from 30.9 seats in 2000 to 36.5 seats in 2012. The number of jets in U.S. regional/commuter service is projected to grow from 569 in 2000 to 2,190 in 2012.

Air Cargo

Air cargo demand by U.S. commercial air carriers is expected to grow at annual rates that are about 1.0 percent higher than those forecast for passenger demand. System RTMs are forecast to grow at an annual rate of 5.8 percent (compared to 4.8 percent for system RPMs) over the 12-year forecast period, with domestic and international RTMs increasing 5.0 and 6.5 percent, respectively.

Cargo freight/express RTMs are forecast to more than double over the forecast period as a strong global economy stimulates the demand for the rapid movement of goods and products by air, both domestically and internationally. Domestic freight/express RTMs are forecast to increase from 12.1billion tons in 2000 to 22.2 billion tons in 2012, an increase of 5.2 percent annually.

International freight/express RTMs, owing to stronger worldwide economic growth, are projected to increase at an average annual rate of 6.7 percent over the forecast period, from 14.8 to 32.0 billion tons.

Most of the growth in freight/express RTMs is expected to come from the all-cargo carriers operating dedicated cargo aircraft. All-cargo domestic and international freight/express RTMs increase at annual rates of 6.2 and 8.2 percent, respectively, over the 12-year forecast period. The percent of domestic freight moved by all-cargo carriers increases from 78.5 percent in 2000 to 87.7 percent in 2012, international freight/express from 50.7 to 60.3 percent.

Significantly slower growth is forecast for mail RTMs as electronic alternatives (fax, email, direct bill payment, etc.) cut into the volume of mail moved by air. Domestic and international mail RTMs are projected to increase at annual rates of 4.1 and 2.8 percent over the forecast period, with domestic mail RTMs increasing from 2.5 to 4.1 billion and international mail RTMs from 531.9 to 745.2 million in 2012.

TABLE I-4

AVIATION DEMAND FORECASTS AND ASSUMPTIONS
REGIONALS/COMMUTERS

FISCAL YEARS 2001-2012

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT/POINT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
REGIONAL/COMMUTERS											
Enplanements (Millions)	55.8	74.3	79.6	85.5	91.1	153.7	7.4	7.1	7.4	6.5	5.6
298-C Carriers	34.8	36.8	34.8	32.7	34.6	56.0	(0.0)	(5.4)	(6.2)	5.8	4.0
Form 41 Carriers	21.0	37.5	44.7	52.8	56.5	97.8	16.4	19.4	18.0	6.9	6.7
RPMs (Billions)	11.9	18.9	22.3	24.8	26.9	52.1	13.4	18.2	11.2	8.6	7.3
298-C Carriers	7.5	9.3	9.1	8.2	8.8	16.0	3.9	(2.6)	(10.1)	7.9	4.8
Form 41 Carriers	4.4	9.5	13.2	16.6	18.1	36.1	24.5	38.6	25.8	9.0	8.7
Fleet (As of December 31)	2,109	2,175	2,312	2,436	2,557	3,673	1.9	6.3	5.4	5.0	3.9
Turboprops	2,031	1,789	1,743	1,726	1,701	1,483	(3.0)	(2.6)	(1.0)	(1.4)	(1.3)
Jets	78	386	569	710	856	2,190	48.8	47.4	24.8	20.6	11.9
Hours Flown (000)	3,817	3,718	3,805	3,984	4,158	6,519	(0.1)	2.3	4.7	4.4	4.6
Average Aircraft Size (Seats)	30.3	35.9	37.5	38.6	39.7	46.0	1.4	1.6	1.1	1.1	0.7
298-C Carriers	27.7	31.2	30.9	30.0	31.0	36.5	0.6	(0.3)	(0.9)	1.0	0.5
Form 41 Carriers	36.1	42.7	44.9	46.0	47.0	53.0	1.8	2.2	1.1	1.0	0.7
Average Trip Length (Miles)	213.6	254.0	280.4	290.2	295.9	338.8	13.4	26.4	9.8	5.7	4.9
298-C Carriers	215.2	253.4	260.9	250.0	255.0	286.0	9.1	7.5	(10.9)	5.0	2.1
Form 41 Carriers	211.0	254.7	295.6	315.0	321.0	369.0	16.9	40.9	19.4	6.0	6.1
Average Load Factor (Percent)	49.3	57.5	59.0	59.6	60.1	62.8	1.9	1.5	0.6	0.5	0.3
298-C Carriers	48.6	55.5	55.2	54.5	54.8	57.0	1.3	(0.3)	(0.7)	0.3	0.2
Form 41 Carriers	50.4	59.7	62.0	62.5	63.0	65.7	2.3	2.3	0.5	0.5	0.3

Source: Regionals/Commuters; 1995-2000, Forms 298-C and 41, U.S. Department of Transportation; 2001-2012, FAA Forecasts

* Enplanements, RPMs, Fleet, and Hours Flown: annual percent change: all other series, annual absolute change.

All-cargo carriers are expected to account for 31.3 percent of mail RTMs in 2012, up from 24.9 percent in 2000. The disparity in all-cargo carrier's share of mail RTMs relative to its share of freight/express traffic (71.5 percent in 2012) reflects the fact that passenger carriers operate flights throughout the day while the majority of all-cargo carrier operations occur at night. Despite this scheduling disadvantage, all-cargo carrier mail RTMs increase by 5.9 percent annually over the forecast period compared to annual growth of only 3.1 percent for the passenger carriers.

GENERAL AVIATION

The general aviation active fleet is projected to total 245,965 in 2012, an increase of just under 25,000 aircraft or 0.9 percent annual growth over the 12-year forecast period. In 2012, piston powered fixed-wing aircraft are expected to continue to account for the majority of the fleet, 75.6 percent compared to 78.1 percent in 2000. However, the turbine powered fixed wing fleet is projected to make the biggest inroads in the general aviation active fleet, increasing its share from 6.0 percent in 2000 to 7.7 percent in 2012. In 2012, experimental aircraft account for 9.8 percent (up from 9.4 percent in 2000) of the fleet while rotorcraft comprise 3.8 percent of the fleet (up from 3.5 percent in 2000).

The current forecast assumes that the business use of general aviation aircraft will expand at a more rapid pace than personal use. This is due, in large part, to the continued rapid growth in fractional ownership and is reflected in the changing composition of the general aviation fleet mix. The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow at four-times the rate forecast for the piston aircraft categories—2.7 compared to 0.6 percent. Turbine-powered fixed wing aircraft are projected to increase at an average annual rate of 3.0 percent, totaling 18,880 in 2012—6,600 turboprops and 12,280 turbojets. The turbine rotorcraft fleet is expected to increase at an annual rate of 1.5 percent over the forecast period, totaling 5,960 in 2012.

The general aviation piston fleet are projected to increase by just over 13,000 aircraft (53.3 percent of the total increase) over the forecast period, totaling 186,000 aircraft in 2012. The single engine fixed wing piston aircraft category increases at an average annual rate of 0.7 percent--from 151,640 aircraft in 2000 to 164,800 in 2012. The number of piston powered rotorcraft increase by just under 1,000 aircraft, totaling 3,500 in 2012. Multi-engine fixed wing piston aircraft are expected to remain constant at 21,200 aircraft throughout the forecast period.

Experimental aircraft are projected to increase by 1.2 percent annually, reaching 24,080 aircraft in 2012. Aircraft in the "other" category (gliders, lighter-than-air, etc) are expected to total 7,545 in 2012, up from 6,825 in 2000.

General aviation hours flown is projected to increase at an average annual rate of 2.2 percent over the 12-year forecast period, to 41.7 million hours in 2012. The larger increase in hours relative to aircraft reflects expected increases in the utilization of the general aviation fleet. In 2012, piston powered aircraft (including rotorcraft) are projected to fly 28.1 million hours (up 1.5 percent annually) while turbine-powered aircraft (including rotorcraft) fly 11.7 million hours (up 4.4 percent annually). Most of the increase in utilization occurs in turbojet fixed wing aircraft, the fastest growing category of general aviation aircraft—active fleet and hours up 4.3 and 7.0 percent annually, respectively. These large increases are due to the expected increases in both the fractional ownership fleet and its activity levels. Utilization of fractional ownership aircraft average approximately 900 hours annually compared to only 325 hours for all business jets.

The number of active pilots are forecast to total 827,177 in 2012, an increase of almost 179,000 (2.0 percent annually) over the 12-year forecast period. Most of the expected growth is projected

TABLE I-5

AVIATION DEMAND FORECASTS AND ASSUMPTIONS
GENERAL AVIATION

FISCAL YEARS 2001-2012

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
GENERAL AVIATION											
Active Fleet (000)	188.1	219.5	221.2	223.5	225.8	246.0	3.3	0.8	1.0	1.0	0.9
Pistons	152.8	171.9	172.8	174.1	175.3	186.0	2.5	0.5	0.7	0.7	0.6
Single Engine	137.0	150.9	151.6	152.9	154.1	164.8	2.0	0.5	0.8	0.8	0.7
Multi-Engine	15.7	21.0	21.1	21.2	21.2	21.2	6.1	0.5	0.3	0.0	0.0
Turbine	9.6	12.8	13.2	13.6	14.1	18.9	6.6	2.9	3.3	3.9	3.0
Turboprops	5.0	5.7	5.7	5.8	5.9	6.6	2.8	1.0	1.5	1.4	1.2
Turbojets	4.6	7.1	7.4	7.8	8.2	12.3	10.3	4.5	4.7	5.8	4.3
Rotorcraft	5.8	7.4	7.6	7.9	8.1	9.5	5.6	2.7	3.4	2.4	1.8
Experimental	15.2	20.5	20.8	21.0	21.3	24.1	6.5	1.2	1.2	1.2	1.2
Other	4.7	6.8	6.8	6.9	6.9	7.5	7.6	0.9	0.9	0.9	0.8
Hours Flown (Millions)	26.6	31.8	32.1	32.8	33.7	41.7	3.8	1.2	2.2	2.6	2.2
Pistons	20.3	22.9	23.0	23.3	23.7	27.4	2.6	0.5	1.4	1.7	1.5
Single Engine	17.8	19.3	19.4	19.7	20.1	23.7	1.7	0.5	1.6	1.9	1.7
Multi-Engine	2.4	3.6	3.6	3.6	3.6	3.7	8.1	0.3	0.3	0.3	0.3
Turbine	2.9	4.5	4.8	5.1	5.4	8.7	10.1	4.8	6.0	6.6	5.2
Turboprops	1.5	1.8	1.8	1.9	1.9	2.1	4.2	0.9	1.5	1.6	1.3
Turbojets	1.5	2.7	2.9	3.2	3.5	6.6	15.1	7.3	8.7	9.5	7.0
Rotorcraft	2.0	2.7	2.8	2.9	2.9	3.7	7.3	1.5	2.9	2.8	2.4
Experimental	1.2	1.2	1.3	1.3	1.3	1.6	1.1	1.1	1.9	2.3	2.0
Other	0.3	0.3	0.3	0.3	0.3	0.4	4.2	0.9	1.2	1.5	1.4
Aircraft Utilization (Hours)	141.5	144.7	145.3	147.0	149.2	169.7	0.5	0.4	1.2	1.5	1.3
Pistons	132.5	133.2	133.1	134.0	135.3	147.0	0.1	(0.0)	0.6	0.9	0.8
Turbine	308.2	355.4	361.7	371.1	380.8	461.6	3.3	1.8	2.6	2.6	2.1
Rotorcraft	336.4	368.4	364.1	362.2	363.6	389.5	1.6	(1.2)	(0.5)	0.4	0.6
Total Active Pilots (000)	639.2	635.5	648.5	665.9	680.9	827.2	0.3	2.1	2.7	2.3	2.0
Instrument Rated Pilots (000)	298.8	309.0	315.1	321.4	327.8	384.1	1.1	2.0	2.0	2.0	1.7

Source: Fleet and Hours; 1995-1999, FAA General Aviation and Air Taxi Activity Survey; 2000-2012, FAA Forecasts
Pilots; 1995-2000, FAA Aeronautical Center; 2001-2012, FAA Forecasts

to occur in the student and airline transport categories. The number of student pilots are projected to increase by over 40,000 (2.7 percent annually), totaling 144,200 in 2010. Airline transport pilots are forecast to increase from 139,700 in 2000 to 204,400 in 2012, an average annual increase of 3.2 percent. Projected growth among other types of pilot certifications include: private pilot certificates, up 1.4 percent annually to 309,600; commercial pilot certificates, up 1.4 percent annually to 148,800; and helicopter only pilots, up 1.8 percent annually to 9,890.

FAA WORKLOAD FORECASTS

There were a total of 459 towered airports at the end of September, 267 FAA towers and 192 contract towers. While the number of FAA towers is expected to remain constant at 267 in 2001, the number of FAA contract towered airports is expected to increase by a total of 29 to 221. This includes the addition of 20 contract towers under a cost-share agreement with local/state governments and another nine to be added under a fully funded agreement. It is assumed that the 29 new contract towers will be phased in throughout the year.

Since 1993, a total of 135 FAA towers have assumed contract tower status. To overcome reporting inconsistencies caused by the tower conversion program, the FAA has, since 1996, developed separate activity forecasts for both FAA and contract towered airports. Activity at FAA Air Route Traffic Control Centers and Flight Service Stations are not affected by the contract tower conversions.

Summary forecasts of aircraft activity at combined FAA and contract tower facilities can be found in Table I-6 (page I-21). Summary forecasts of activity at FAA facilities only, including FAA towers, en route centers, and flight service stations, can be found in Table I-7 (page I-22). More detailed forecasts and discussion of aircraft activity at FAA and contract facilities can be found in Chapter VII and in Tables 32 through 49 in Chapter X.

FAA and Contract Towers

Activity at the combined FAA and contract towers is projected to grow from 68.7 million in 2000 to 91.5 million in 2012, an annual increase of 2.4 percent. A large part of the growth is the result of increased commercial aircraft activity, with air carrier and commuter/air taxi activity up 3.1 and 2.4 percent, respectively, over the 12-year forecast period.

General aviation activity is forecast to increase from 39.9 million operations in 2000 to 52.2 million operations in 2012, an annual increase of 2.3 percent. Much of this growth occurs in 2001 (up 3.08 percent) and 2002 (up 5.7 percent) and is due to the addition of the 29 new contract towers in 2001. Thereafter, general aviation activity grows at an annual rate of 1.8 percent. The addition of new contract towers also results in an increase in military activity--from 2.9 million in 2000 to 3.2 million in 2002. Military activity is then held constant at the 2002 activity level throughout the remainder of the forecast period.

Combined instrument operations counts at FAA and contract towered airports increase from 53.0 million in 2000 to 69.2 million in 2012, an annual increase of 2.2 percent. Commercial aircraft instrument operations are forecast to grow at a significantly faster rate than are general aviation instrument operations, up 2.7 and 1.9 percent, respectively. Military activity is expected to remain constant at 3.6 million operations through 2012.

TABLE I-6

AVIATION ACTIVITY FORECASTS
COMBINED FAA AND CONTRACT TOWERS

FISCAL YEARS 2001-2012

ACTIVITY MEASURES (In Millions)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
NUMBER OF TOWERS											
FAA Towers	326	288	267	267	267	267					
FAA Contract Towers	95	166	192	221	221	221					
TOTAL	421	454	459	488	488	488					
AIRCRAFT OPERATIONS											
Air Carrier	13.6	14.6	15.2	15.6	16.0	21.8	2.1	4.0	2.7	3.1	3.1
Commuter/Air Taxi	10.2	10.6	10.8	11.1	11.4	14.3	1.0	1.8	2.9	3.2	2.4
General Aviation	35.9	40.0	39.9	41.4	43.7	52.2	2.1	(0.5)	3.8	5.7	2.3
Itinerant GA	20.9	23.0	22.8	23.8	24.9	29.6	1.8	(0.8)	4.0	5.0	2.2
Local GA	15.1	17.0	17.0	17.6	18.8	22.5	2.4	0.0	3.5	6.7	2.4
Military	2.6	3.0	2.9	3.0	3.2	3.2	2.2	(1.2)	3.5	6.8	0.8
Itinerant MIL	1.3	1.4	1.4	1.5	1.5	1.5	1.6	(0.2)	2.3	4.3	0.5
Local MIL	1.3	1.5	1.5	1.5	1.7	1.7	2.9	(2.2)	4.7	9.1	1.1
TOTAL	62.4	68.2	68.7	71.0	74.4	91.5	1.9	0.8	3.4	4.8	2.4
INSTRUMENT OPERATIONS											
Air Carrier	14.7	15.8	16.5	17.0	17.5	23.7	2.4	4.4	2.6	3.0	3.0
Commuter/Air Taxi	11.0	11.6	11.6	11.9	12.1	15.2	1.2	0.3	2.2	1.9	2.3
General Aviation	18.2	20.9	21.3	21.7	22.1	26.7	3.2	1.8	2.0	1.9	1.9
Military	3.6	3.5	3.6	3.6	3.6	3.6	(0.0)	1.6	0.0	0.0	0.0
TOTAL	47.4	51.8	53.0	54.1	55.3	69.2	2.3	2.3	2.1	2.1	2.2

Source: FY 1995-2012, FAA Data and Forecasts

TABLE I-7

AVIATION ACTIVITY FORECASTS
FAA FACILITIES

FISCAL YEARS 2001-2012

ACTIVITY FORECASTS (In Millions)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	1999	2000	2001	2002	2012	95-00	99-00	00-01	01-02	00-12
AIRCRAFT OPERATIONS											
Air Carrier	13.6	14.4	14.9	15.3	15.8	21.4	1.9	3.4	2.6	3.0	3.0
Commuter/Air Taxi	9.8	9.3	9.2	9.4	9.6	12.1	(1.3)	(1.1)	2.2	1.9	2.3
General Aviation	32.3	29.1	27.0	27.5	27.9	33.3	(3.5)	(7.4)	1.8	1.8	1.8
Itinerant GA	18.9	17.4	16.3	16.7	17.0	20.2	(2.9)	(6.6)	2.4	2.0	1.8
Local GA	13.4	11.7	10.7	10.8	10.9	13.1	(4.4)	(8.7)	0.8	1.4	1.7
Military	2.3	2.2	2.1	2.1	2.1	2.1	(2.1)	(5.6)	0.0	0.0	0.0
Itinerant MIL	1.2	1.1	1.1	1.1	1.1	1.1	(1.7)	(2.5)	0.0	0.0	0.0
Local MIL	1.1	1.1	1.0	1.0	1.0	1.0	(2.6)	(8.9)	0.0	0.0	0.0
TOTAL	58.0	55.1	53.2	54.2	55.4	68.8	(1.7)	(3.4)	2.0	2.1	2.2
INSTRUMENT OPERATIONS											
Air Carrier	14.6	15.7	16.4	16.8	17.3	23.5	2.3	4.2	2.6	3.0	3.0
Commuter/Air Taxi	10.8	11.3	11.2	11.5	11.7	14.7	0.8	(0.2)	2.2	1.9	2.3
General Aviation	18.1	20.6	21.0	21.4	21.8	26.4	3.0	1.7	2.0	1.9	1.9
Military	3.5	3.5	3.5	3.5	3.5	3.5	(0.2)	1.5	0.0	0.0	0.0
TOTAL	47.0	51.1	52.2	53.2	54.4	68.1	2.1	2.0	2.1	2.1	2.3
IFR AIRCRAFT HANDLED											
Air Carrier	21.0	24.0	25.0	25.6	26.4	35.9	3.5	3.9	2.6	3.0	3.1
Commuter/Air Taxi	6.9	7.7	8.1	8.3	8.4	10.6	3.1	4.8	2.2	1.9	2.3
General Aviation	7.8	8.8	8.7	8.9	9.1	11.0	2.2	(0.7)	2.0	2.0	1.9
Military	4.4	4.1	4.2	4.2	4.2	4.2	(0.9)	3.0	0.0	0.0	0.0
TOTAL	40.1	44.7	46.0	47.0	48.1	61.7	2.8	3.1	2.2	2.3	2.5
FLIGHT SERVICES											
Pilot Briefs	9.2	8.3	7.7	7.6	7.6	7.1	(3.4)	(7.2)	(0.9)	(0.9)	(0.7)
Flight Plans Originated	6.3	6.3	5.9	6.0	6.0	6.3	(1.3)	(5.1)	0.8	0.7	0.5
Aircraft Contacted	4.2	3.3	3.2	3.2	3.1	2.7	(5.3)	(3.0)	(1.5)	(1.5)	(1.5)
TOTAL	35.2	32.4	30.5	30.4	30.3	29.5	(2.8)	(5.9)	(0.3)	(0.3)	(0.3)
DUATS	11.5	13.4	15.0	16.2	17.1	20.7	5.5	12.2	7.9	5.9	2.7
TOTAL (w/DUATS)	46.7	45.8	45.5	46.6	47.4	50.2	(0.5)	(0.6)	2.4	1.8	0.8

Source: FY 1995-2012, FAA Data and Forecasts

FAA En Route Centers

The workload at FAA en route traffic control centers is forecast to increase at an average annual rate of 2.5 percent during the 12-year forecast period. In 2012, FAA en route centers are expected to handle 61.7 million IFR aircraft, up from the 46.0 million in 2000

The number of commercial aircraft handled is projected to increase at an annual rate of 2.9 percent while the number of general aviation aircraft handled increases at an average annual rate of 1.9 percent. Military activity at en route centers is held constant at its 1999 activity level of 4.2 million.

The higher growth rate at FAA en route centers, relative to activity at combined towered airports, reflects the fact that commercial activity accounts for a significantly larger percentage of center activity—71.9 versus 37.7 percent at towered airports in 2000. Therefore, the projected larger increases in commercial aircraft activity have a much greater impact on total center traffic during the forecast period.

FAA Flight Service Stations

Total flight services originating at traditional FAA flight service stations (non-automated) are forecast to decline from 30.5 million in 2000 to 29.5 million in 2012, an average annual rate of decline of 0.3 percent. Of the services provided by the FAA, only flight plans originated is projected to increase over the forecast period, growing from 5.9 million in 2000 to 6.3 million in 2012. Both pilot briefings and the number of aircraft contacted are forecast to decline over the next 12 years, down 0.7 and 1.5 percent annually.

The number of DUATS services are projected to grow at an average annual rate of 2.7 percent over the forecast period, from 15.0 million in 2000 to 20.7 million in 2012. Combined FSS and DUATS services are expected to total 50.2 million in 2012, an annual increase of 0.8 percent.

FORECAST RISKS

There are a number of positive signs that point toward a continuation of moderate to strong growth in both the commercial and general aviation industries. This includes the projected strong growth in both the U.S. and worldwide economies and declining real fuel prices throughout the forecast period. However, there are also a number of uncertainties that could cause the growth of the U.S. and world economies to be less than that projected. Slower economic growth would ultimately slow the demand for aviation services.

While there appears to be unanimity among the economic forecasting services and OMB regarding continued strong growth in U.S economic activity, there are a number of factors or recent trends that could slow or reverse this optimistic outlook.

The U.S. economy grew at just a 2.2 percent annual rate in 3rd quarter 2000, the slowest pace in 4 years. Opinions are mixed as to whether this portends significantly slower growth over the next several years or whether it represents a temporary slowdown with stronger growth resuming once again in the 4th quarter. The unemployment rate also increased to 4.0 percent in the third quarter, pointing to slower job growth and yet another sign of a slowing U.S. economy. WEFA assesses a 20 percent probability for its "slow growth" scenario (0.9 percentage point less growth in 2001) and a 15 percent probability for its "recession" scenario.

Over the past several years, the U.S. economy has benefited considerably from the "wealth effect"

created by the large increases in market equity values. A continuation and/or escalation of the recent correction in stock market equity values (the NASDAQ lost half its value in the past 9 months), considered inevitable by many economists, could dry up venture capital which would hit the "new economy" particularly hard. In addition, a large sustained correction would also erode household wealth, dampen consumer confidence, and result in a sharp decline in consumer spending for goods and services, including air travel.

A number of Wall Street financial analysts blame higher interest rates for the recent decline in stock market values. The Federal Reserve has raised interest rates six times over the past 2 years. As a result, real interest rates are at their highest levels in 15 years. The higher interest costs force business to spend more money on interest costs, thus reducing corporate profits and acting as a drain on the economy. WEFA predicts that the Federal Reserve will lower interest rates twice in 2001.[5]

Additionally, rising fuel cost present a major risk for all segments of the economy, in particular aviation. The OMB forecasts assume a 23.0 percent reduction in fuel prices over the next 3 years and declining real fuel prices over the entire 12-year forecast period. Compared to other economic forecasting services, this is relatively optimistic and, it would appear that most of the risk is on the downside. Escalation of the current Middle East unrest could push oil prices still higher. Should this occur, the potential impact on U.S. and world economic growth and air travel could be considerable.

Many air carriers benefited from hedging strategies in 2000, essentially locking in fuel prices at prices considerably lower than current market prices, thus forestalling much larger increases in air fares. Unfortunately, much of the industry remains unhedged for 2001 and any escalation of fuel prices would likely have to be passed through in its entirety to the flying public.

Labor problems at United Airlines disrupted the carrier's schedules during summer 2000, resulting in the cancellation of approximately 15,000 flights during the 4-month June-September period. The recently concluded pilots' agreement at United, thought to be excessive by many financial analysts, has, in effect, established a higher wage base for contract negotiations at other airlines. Currently, contract negotiations are underway at American, Continental, Delta, Northwest, and United (mechanics and flight attendants). Labor unrest is once again threatening to disrupt carrier schedules. These actions could result in lower activity counts in 2001. The price of labor peace might well be significantly higher labor costs. Higher labor costs would result in higher fares and subsequently lower passenger demand throughout the entire forecast period.

The U.S. Department of Justice is expected to rule on the proposed United Airlines/U.S. Airways merger in early spring 2001. Approval of the merger could lead in another round of industry consolidation, possibly resulting in an industry dominated by three or four "mega" carriers.[6] Such a restructuring of the industry would have a significant impact on both the demand for air transportation and on the aviation activity forecasts contained herein.

A slowing of U.S. economic growth would also impact the earnings of corporations and ultimately travel budgets. In addition, much of corporate America remains at odds with the U.S. commercial airline industry over what it perceives as unreasonable and rapidly increasing fares for business travelers. Higher fares could

[5] In a surprise move, the Federal Reserve lowered interest rates by 50 basis points on January 3, 2001.

[6] American Airlines has announced its intentions to acquire Trans World Airways as well as taking a minority stake (49 percent) in DC Air. If both the United Airlines/US Airways and American transactions proceed as planned, United and American could control more than 55 percent of U.S. domestic airline capacity. (Source: Aviation Daily, Tuesday, January 9, 2001)

force business to implement a number of measures to contain rising travel costs, including a cutback in commercial air travel and/or a shift to travel by corporate jets or fractional ownership companies.

The general aviation industry is also vulnerable to an economic slowdown or recession, although not to the same extent it would have been several years ago. The turnaround in the demand for general aviation products and services since 1994 has occurred during a period of unprecedented economic growth. No one actually knows how the industry would react to a protracted slowing of demand or an economic recession. However, the slowdown in general aviation activity at FAA facilities in 2000, presumably the result of escalating fuel prices, shows that the general aviation community does respond negatively to unfavorable economic conditions.

The economic forecasts used to project passenger traffic in the Asia/Pacific and Latin American markets—4.6 and 4.4 percent annually over the 12-year forecast period--are extremely optimistic, and not unlike the projected large declines in fuel prices, most of the risk appears to be on the downside. The Japanese economy continues to send mixed signals, and since most Asian countries trade heavily with each other, any slowdown in growth could negatively impact the entire region. Additionally, a slowdown in U.S. economic activity would also negatively impact those Asian countries whose economies are dependent on trade with the United States.

The outlook for Latin America continues to depend on political actions rather than economic fundamentals. Almost all the countries in the Latin American region are experiencing setbacks at the political level, as economic and market oriented reforms have not translated into political system reforms. If the new political leadership in Mexico, Peru, Columbia, and Argentina fail to implement the needed political system reforms, foreign capital investment could slow or cease entirely, thus placing the optimistic economic forecasts for the region in doubt.

Increased flight delays have become a major problem for the airlines, the traveling public, and the FAA. Delays are closely linked to demand and increased delays are a potential risk to achieving the aviation demand forecasts presented in this document.

It is the growth over the last 4 years that has given rise to the increased delays. During this period, activity at combined FAA and contract towers and en route centers grew at average annual rates of 3.0 and 3.3 percent, respectively. And growth is not just confined to commercial activity, which grew at annual rates of 2.2 and 3.7 percent, respectively. What was not expected was the strong resurgence in the noncommercial sector (general aviation and military) which had been declining or dormant for the past decade. Growth among these users averaged 3.8 and 2.3 percent annually over the last 4 years.

Similar growth is projected to continue for both the commercial and noncommercial sectors throughout the 12-year forecast period, averaging 2.3 percent annually at combined towers and 2.5 percent annually at en route centers. This high level of growth among both commercial and general is a phenomenon that last occurred during the late 1970s. What these increased activity levels presage in terms of future air traffic delays or constraints on future demand is something that should be of concern to the FAA, aviation officials, corporate America, and the flying public. Increased delays will not only raise carrier costs but could also act as a constraint to market entry. The consequence of both events is rising fares and constrained demand.

If the economic scenarios presented in this document--sustained moderate growth for both the U.S. and world economies--are achieved, there is every reason to believe that the demand for commercial and general aviation products and services will continue to expand throughout the forecast period. The real question is whether

there will be enough capacity (airside and landside) to accommodate the projected growth.

FORECAST SUMMARY

Highlights of the current FAA aviation forecasts for the 2001 to 2012 time period include:

- The U.S. economy is expected to grow slightly less than that of worldwide economic activity (3.1 versus 3.4 percent annually), with most of world economic growth taking place in the Asia/Pacific (4.6 percent annually) and Latin American (4.4 percent annually).

- International passenger traffic is forecast to grow significantly faster than U.S. domestic traffic (6.1 versus 3.6 percent annually), with most of the international growth occurring in Latin American and Asia/Pacific markets, averaging 6.8 and 6.2 percent, respectively.

- Regional/commuter passenger traffic will continue to grow at a faster rate than their larger domestic counterparts (5.6 versus 3.6 percent annually). Growth in the industry is derived from the establishment of new markets utilizing the new regional jets and from further route rationalization by the larger commercial carriers.

- Air cargo traffic is expected to grow at rates about one percent higher than those predicted for passenger traffic, with domestic and international RTMs increasing at annual rates of 5.0 and 6.5 percent, respectively.

- The growth exhibited throughout the general aviation community, combined with industry-wide promotional programs, is expected to result in moderate sustained increases in the active fleet (0.9 percent annually), hours flown (2.2 percent annually), and student pilots (3.4 percent annually).

- Total aviation activity at FAA and contract facilities is expected to grow at annual rates of 2.2 to 2.5 percent annually, with commercial activity (up 2.7 percent annually) increasing at significant higher rates than those predicted for general aviation (1.9 to 2.3 percent annually).

Uncertainties that have the potential to limit the growth in the demand for U.S. and international aviation services include:

- The economic forecasts used to develop this year's aviation demand forecasts, both domestic and international, appear to be on the optimistic side. Therefore, most of the risk associated with these projections appears to be on the downside.

- The rising cost of fuel presents a major risk for all segments of the economy, in particular aviation. Although the current forecast projects a rapid decline in fuel prices over the next several years, an escalation of the current Middle East unrest could push oil prices still higher. Should this occur, the potential impact on U.S. and world economic growth and air travel could be considerable.

- The price of labor peace is growing and could lead to significantly higher labor costs over the forecast period. Higher labor costs would lead to higher air fares and lower the demand for air transportation.

- The economic forecasts used to project passenger traffic in the Asia/Pacific and Latin American markets are also extremely optimistic. However, the Japanese economy continues to send mixed signals and economic outlook for Latin America continues to depend on political actions rather than economic fundamentals. If the current internal economic problems are not resolved, the potential for economic slowdowns or

recessions in Asia and South America remain a very distinct possibility.

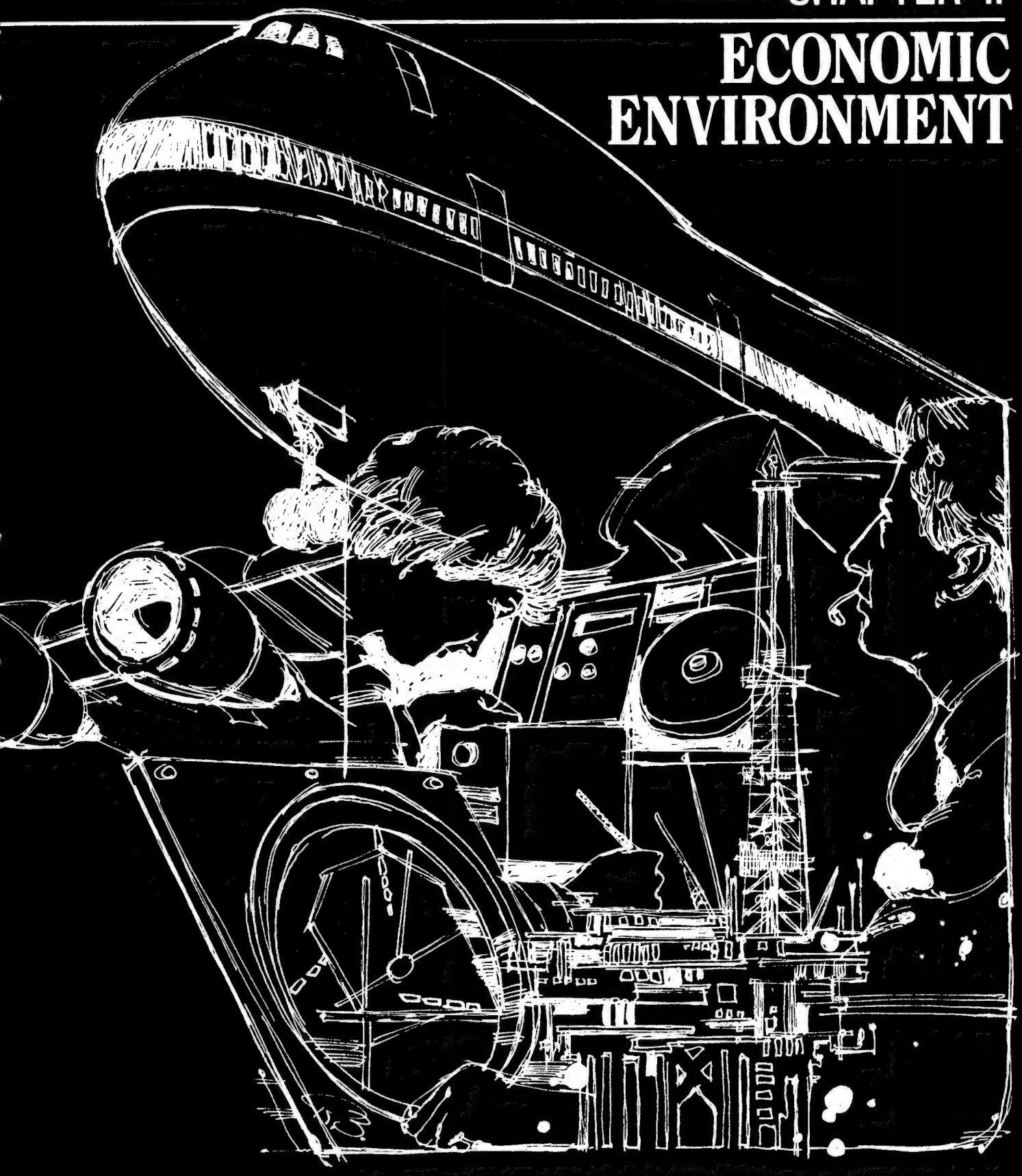
- No one actually knows how the recovering general aviation industry or its customers will react to an economic slowdown or recession. However, the decline in general aviation activity in 2000, presumably the result of escalating prices for aviation fuels, shows that the general aviation community responds negatively to unfavorable economic conditions.

Increased flight delays are a major problem for the airlines, the traveling public, corporate America, and the FAA. Delays are closely linked to demand and increased delays are perhaps, the major risk to achieving the aviation demand forecasts presented in this document.

Nevertheless, air transportation is expected to continue to dominate all other transportation modes in both long distance domestic inter-city travel and in international passenger markets throughout the foreseeable future.

CHAPTER II

ECONOMIC ENVIRONMENT



CHAPTER II

ECONOMIC ENVIRONMENT

This chapter discusses the historical and forecast economic data used to project aviation demand. Data are derived from several sources. U.S. economic data are derived from annual and quarterly data supplied by the Office of Management and Budget (OMB), the Council of Economic Advisors, and two economic forecasting services—WEFA, Inc (WEFA) and DRI McGraw-Hill (DRI). Quarterly data for those series used to develop the aviation demand forecasts--Gross Domestic Product (GDP), the Consumer Price Index (CPI), and the Oil and Gas Deflator--are presented as annualized rates. The Bureau of Economic Analysis revised its method of calculating GDP in 1997. These changes have resulted in significantly higher GDP growth rate projections and are discussed in further detail later in this chapter.

The specified years for the economic data discussed in this chapter are as follows: U.S. economic data are on a U.S. government fiscal year (FY), October through September, and international economic data are on a calendar year (CY), unless indicated otherwise. Both FY and CY estimates are calculated by averaging the four quarters for the period. The WEFA international economic estimates provide the basis for developing the international aviation forecasts.

REVIEW OF 2000

UNITED STATES

The current U.S. economic expansion is now in its 10th year, making this the longest expansion of the post-World War II era. This unparalleled growth began in the second quarter of 1991 just after the Gulf War downturn and has lasted a full 38 quarters. The next longest expansion lasted from first quarter 1961 to third quarter 1969 (35 quarters).

The U.S. economy expanded at a searing pace during the first 3 quarters of the fiscal year (October 1999 through July 2000) rising 8.3, 4.8, and 5.6 percent on a seasonally adjusted annual rate. The pace eased to 2.2 percent during the fourth quarter. For the year as a whole, U.S. GDP expanded at the rate of 5.4 percent, more than a percentage point over the 4.3 and 4.1 percent growth rates recorded in 1998 and 1999. Rising short-term interest rates and a recent decline in the equities market provide some concern in an otherwise cloudless horizon. Short-term (3-month) interest rates rose through 2000 from 4.9 percent in October 1999 to 6.0 percent in September 2000. Although the stock market rose through most of

2000, its steep decline in the first quarter of 2001, a fall of 16 percent, may portend unsettled economic waters.

Overall price inflation, as measured by the consumer price index (CPI), climbed to a 3.2 percent rate in 2000, substantially higher than the 1.9 percent rate growth of a year earlier. Volatile fuel prices soared in 2000, rising 29.5 percent. This huge increase follows two years where gasoline and oil prices dropped by 9.1 and 1.0 percent in 1998 and 1999.

The annual average unemployment rate continued to decline in 2000, falling from a rate of 4.2 to 3.9 percent--the lowest level since 1969. Employment rose 1.4 percent to an average level of 135.4 million at the end of 2000.

The expanding U.S. economy, combined with the threat of rising price inflation compelled the Federal Reserve Board[1] (FED) to continue putting on the breaks to prevent excess inflationary pressures. The FED raised interest rates four times during the fiscal year: 25-basis points in November 1999; 25-basis points in February 2000; 25-basis points in March 2000; and 50-basis points in May 2000. During this period, the federal discount rate was raised from 4.75 to 6.0 percent, while the federal funds rate increased from 4.5 to 6.5 percent.[2]

WORLD

Picking up its pace, world GDP expanded by 4.4 percent in 2000, up appreciably from the 3.0 percent growth recorded a year earlier. The relative increase in the rate of growth reflects rapidly expanding economies worldwide, including those of Asia who appear to have finally recovered from the economic slowdown in 1997-98. The economic recovery in Asia is shown by growth rates of 3.0 percent in 1999 and 4.3 percent in 2000, this following a 0.6 percent decline in 1998. All major world regions experienced economic growth in 2000. The United States expanded most rapidly at a pace of 5.1 percent (CY 2000); Europe, Africa, and the Middle East expand at the slowest pace, 3.6 percent.

European Union (EU) nations reported combined GDP growth of 3.5 percent in 2000, up substantially from the 2.4 percent rate of 1999. GDP growth rates among EU countries ranged from a high of 10.3 percent in Ireland to a low of 2.4 percent in Denmark. Eurasia, including the countries of the former Soviet Union and Eastern Europe, grew at a substantial 4.6 percent in 2000. This follows a climb of 2.7 percent in 1999 and decline of 1.1 percent in 1998.

Much of the rapid GDP growth in the Middle East countries--up 6.3 percent compared to 2.6 percent in 1999--is accounted for by the recent spike in oil prices. Economic growth in Africa averaged 3.9 percent in 2000, up from 2.5 percent last year.

China once again led the world in economic growth of large countries, with real GDP expanding by 7.7 percent in 2000--up from the 7.1 percent gain a year earlier. The Pacific Basin countries--Hong Kong (governed by China), Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand showed substantial gains for a second consecutive year, up 5.9 and 6.9 percent in 1999 and 2000, following a 5.0 percent decline in 1998. The economies of Australia and New Zealand both expanded by 4.2 percent in 2000.

Latin American countries recorded economic growth of 3.7 percent in 2000 after growth of only 0.8 percent a year earlier. All countries

[1] Official title is "Board of Governors, Federal Reserve System."

[2] On January 3, 2001 the FED moved to cut it Federal Funds rate from 6.5 to 6.0 percent marking the first interest rate cut Since November 1998 and follows six rate hikes that began in June 1999.

within Latin America showed growth in 2000 with Argentina and Brazil, the region's largest economies growing by 1.5 and 4.2 percent, respectively. The economies of Canada and Mexico grew by 4.7 and 6.5 percent, respectively.

Among the foremost developed economies know as the G-7 nations—United States, Canada, United Kingdom (U.K.), Germany, Italy, France, and Japan--the United States displayed the most strength with growth of 5.1 percent followed by Canada with 4.7 percent. The Japanese economy continued to lag in growth among the G-7, finishing the year with growth of 2.1 percent.

Price inflation remained at very low levels among all G-7 countries in 2000. The U.S. (3.3 percent) had the highest inflation among the seven countries, while Japan once more managed a small price decrease--down 0.5 percent. The remaining countries displayed price increases ranging from 3.0 percent in the U.K. to 1.5 percent in France.

Interests rates rose in all G-7 countries in 2000. Among the seven nations, the U.S., U.K. and Canada each had short-term interest rates near 6.0 percent or above--6.5, 6.3, and 5.7 percent, respectively. Japan boasted a very low 0.4 percent rate. Rates in Germany and France were at 4.4 percent in 2000 while Italy came in with a 3.6 percent rate.

Only the Japanese yen appreciated substantially against the U.S. dollar during 2000, with the cost of $1.00 declining from 113.9 to 106.4 yen, suggesting a relative strengthening of the Japanese economy. With the exception of the Canadian dollar, which rose in value from 1.49 to 1.47 to the U.S. dollar, the remaining countries of the G-7 group found their currency lower relative to the dollar in 2000. The French franc (7.1/$1) and Italian lira (2124.3/$1) each depreciated 17 percent against the dollar in 2000. The German mark (2.2/$1) fell 16 percent, while the British pound (0.65/$1) lost 5 percent.

U.S. ECONOMIC OUTLOOK

The economic assumptions used in developing the FAA baseline aviation forecasts are derived from estimates provided by the Executive Office of the President, Office of Management and Budget (OMB). OMB provides estimates for the period 2000 through 2011. The final forecast year—2012--is derived by extrapolating the last year's annual growth rate. The GDP projections are Bureau of Economic Analysis (BEA) chain-weighted estimates with a base year of 1996.

SHORT-TERM ECONOMIC OUTLOOK

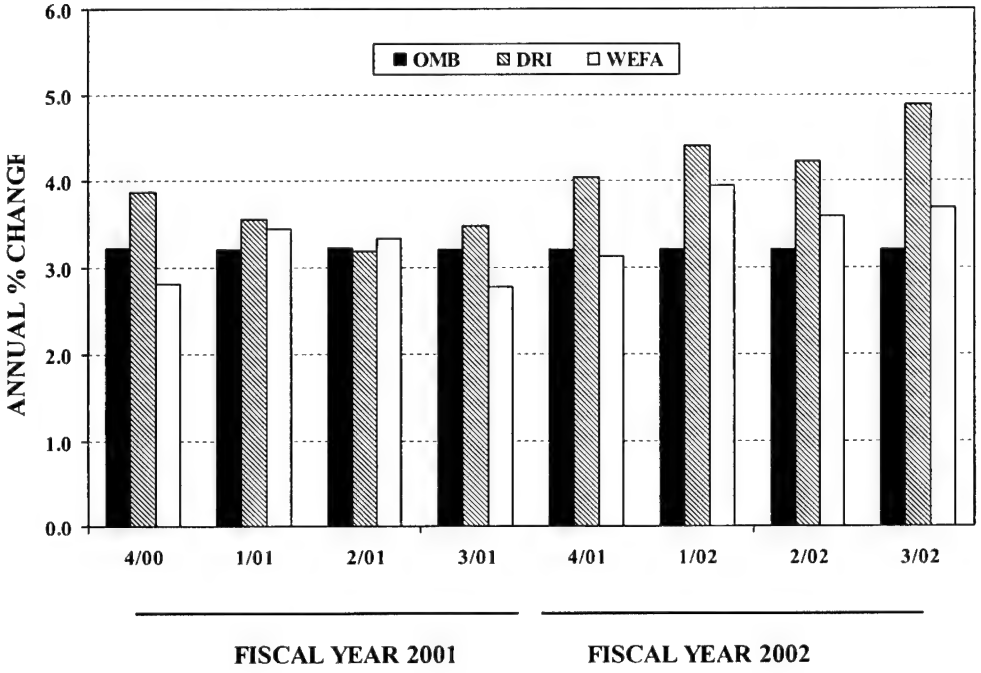
Graphics presented on the following page show modest economic growth accompanied by restrained price increases over the next 2 years. OMB estimates indicate that real GDP growth will slow to 3.5 percent in 2001 and to 3.2 percent in 2002. The consensus estimate of the two major private forecasting firms used by FAA, WEFA and DRI, projects U.S. GDP to grow at 3.3 and 3.5 percent over the next two years.[3] These modest growth rates present a picture of a soft landing for an economy growing at a near breakneck pace of 5.4 percent in 2000.

Price increases, as measured by the CPI for urban consumers, are projected to rise at a 2.9 percent rate in 2001 and a more moderate 2.5 percent in 2002. After rising 29.5 percent in 2000, fuel prices, measured as the oil and gas

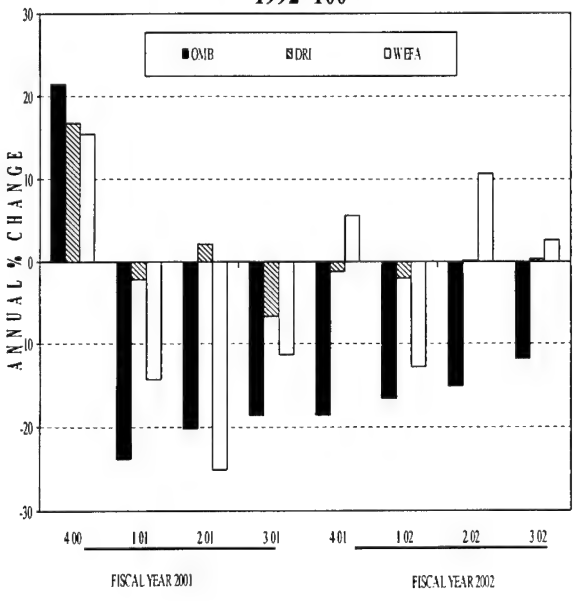
[3] This consensus forecast is the average forecast for DRI and WEFA. See Chapter X, Table 3.

U.S. SHORT-TERM ECONOMIC FORECASTS

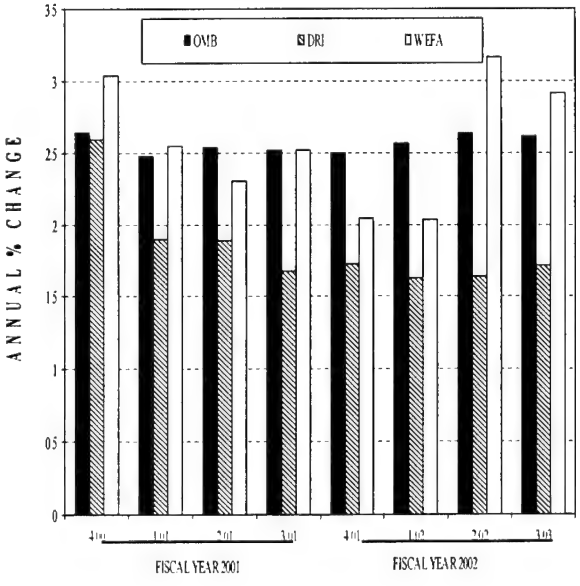
REAL GROSS DOMESTIC PRODUCT
(1996 DOLLARS, CHAIN-WEIGHTED)



OIL AND GAS PRICE INDEX
1992=100



CONSUMER PRICE INDEX
(1982-84 = 100)



price index, are projected to climb by only 1.2 percent in fiscal year 2001. OMB projects a 17.9 percent fall in fuel price in 2002. The consensus forecast[4] shows fuel price increasing 4.3 percent in 2001, then falling 5.9 percent 2002. The cartel of oil producing and exporting countries (OPEC) have succeeded in limiting oil supplies and its success has led to substantially higher fuel prices. The inherent instability of cartels and the naturally volatile nature of commodity prices raise the uncertainty of fuel price projections.

LONG-TERM ECONOMIC OUTLOOK

The long-term economic outlook for the U.S. economy shows real GDP growth averaging 3.1 percent over the 12-year forecast period. Long-term GDP growth depends on underlying demographic and labor supply growth along with gains in productivity. Growth relies on increases in the factors of production, labor and capital, and increases in the productivity of those factors. Labor supply depends on population changes, labor force participation rates, and hours worked. Productivity changes depend on the savings rate, capital accumulation, physical and human capital, and technology.

While the U.S. labor supply is expected to expand at a moderate rate over the forecast period, economic factors--including low interest rates, increasing capital investment, and continued technological growth from the cyber revolution--provide a base for U.S. economic expansion over the forecast period.

Based on projected increases in the population and the share involved in the labor force (labor force participation rate), the labor supply is expected to increase over the forecast period. U.S. working age population (16 years old plus) is projected to increase modestly over the forecast from 209.9 to 235.1 million, an annual increase of 0.9 percent annually. The labor force participation rate is forecast to increase from 67.4 to 68.9 percent between 2000 and 2012. Hence, the U.S. labor force will increase by 1.1 percent annually over the forecast period.

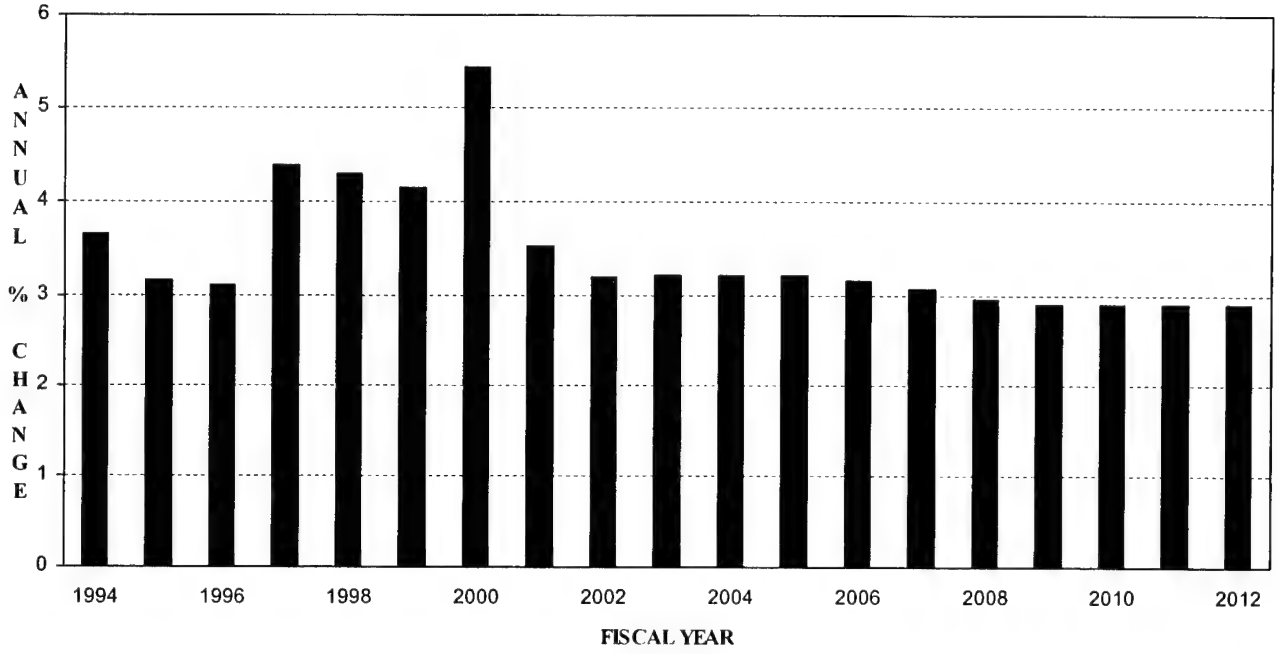
The increasing labor force participation rate for those 65 years old and over is expected to bring more retirement-age Americans into the labor force. The number of persons 65 years and over will increase at a rate nearly double that of the overall working age population—1.6 percent compared to 0.9 percent. The rapidly growing number of senior citizens, along with increases in their labor force participation rates, assures that the number of older workers in the labor force will continue to grow. For instance the labor force participation rate among men 65 to 69 years old is projected to rise from a level of 26.6 in 1995 to 27.9 percent in 2005. For women of this age group, the labor force participation rate is forecast to rise from 18.2 to 20.7 percent over the same period. Forces underlying this upward trend include better health of older workers and increased demand for experienced employees. This increased labor force participation of older employees will help cushion income pressures on younger workers and provide more disposable income to the elderly.

Significant factors influencing labor productivity include: educational achievement, training and skill attainment, investment in productivity-increasing capital goods, and technology. WEFA projects continued strong growth in capital stock investment. Real fixed investment by businesses is expected to increase at an 8.3 percent annual rate over the period 1999 to 2004 and by 5.0 percent annually over the remainder of the forecast period. Providing further evidence of a strong increase in labor productivity, the capital-to-labor ratio is projected to rise 3.7 percent annually over the next 12 years. The increased capital is expected

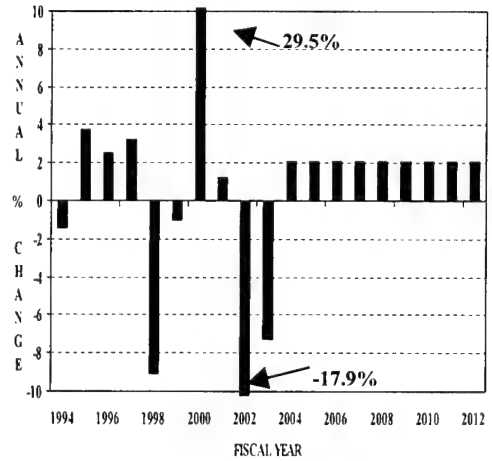
[4]. This consensus forecast is the average forecast for DRI and WEFA. See Chapter X, Table 3.

U.S. LONG-TERM ECONOMIC FORECASTS

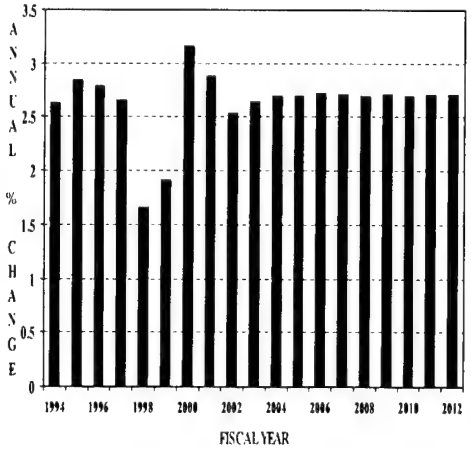
GROSS DOMESTIC PRODUCT
(1996 DOLLARS, CHAIN-WEIGHTED)



OIL AND GAS PRICE INDEX
(1992=100)



CONSUMER PRICE INDEX
(1982-84=100)



to bring about a 2.9 percent annual increase in output per hour.

The inflation outlook continues to show modest price rises during the forecast period. Consumer prices are projected to increase at an average annual rate of 2.7 percent through 2012. Oil prices remain volatile during the first 3 years of the forecast period--up 1.2 percent in 2001, down a combined 23.9 in 2002-03. However, oil and gas prices are projected to settle down and increase at an average annual rate of 2.1 percent over the remainder of the forecast period, 0.6 percentage points less than the annual rate of inflation. Over the 12-year period, fuel prices are expected to decline by 0.6 percent annually, 3.3 percent in real terms.

Alternative Forecasts

The alternative U.S. economic forecasts presented in Chapter X, Table 3, show a supplemental view to that presented by OMB. DRI and WEFA forecasts have been averaged to attain a consensus forecast. In the short-term, the consensus forecast (converted to a FY basis) shows GDP rising 3.3 percent in 2001 and 3.5 percent in 2002. OMB projects 3.5 percent growth in 2001 and 3.2 percent in 2002. The consensus forecast shows projected increases in consumer prices of 2.9 and 2.1 percent in 2001 and 2002, respectively. The more erratic gas and oil price index is forecast to rise by 4.3 percent in 2001 and then drop 5.9 percent the following year.

Over the entire forecast period (2000-12), the consensus estimate of economic growth is 3.4 percent annually, higher than OMB's 3.1 percent growth rate. As to price changes, the private forecast groups project overall price increases of 2.6 percent compared to the 2.7 percent forecast by OMB. The consensus forecast projects fuel prices to increase 1.3 percent annually compared to OMB's fuel price decline of 0.6 percent annually.

WORLD ECONOMIC OUTLOOK

The principal series used in developing FAA's international traffic forecasts are discussed in the following paragraphs. These data are presented in tabular form in Chapter X, Tables 4 and 5. International GDP data are presented on a calendar year basis and are expressed in 1990 U.S. dollars. GDP and exchange rates for individual countries, as well as groups of countries, are obtained from WEFA's *World Economic Outlook* (Fourth Quarter 2000).

WORLD GDP

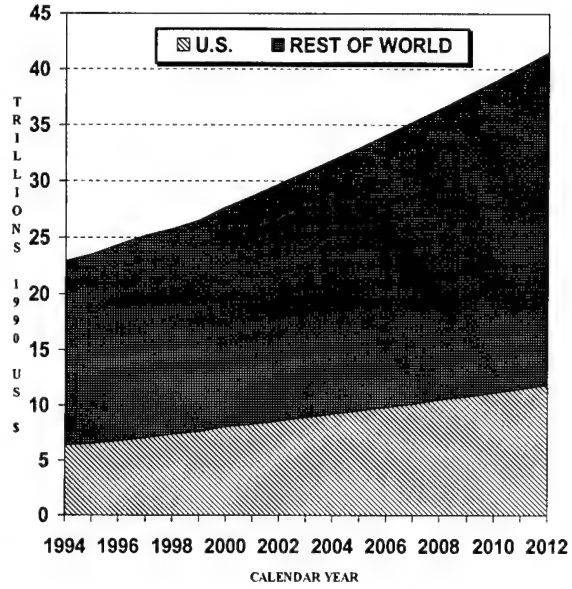
The graphics on the following page depict both the historical trend and projected GDP growth for major economic regions of the world. Worldwide GDP is projected to increase by nearly $1.1 trillion to a level of $28.7 trillion in 2001, an annual increase of 3.8 percent. Over the 12-year forecast period, world output is projected to rise to $41.6 trillion, an annual growth rate of 3.4 percent.

Canada

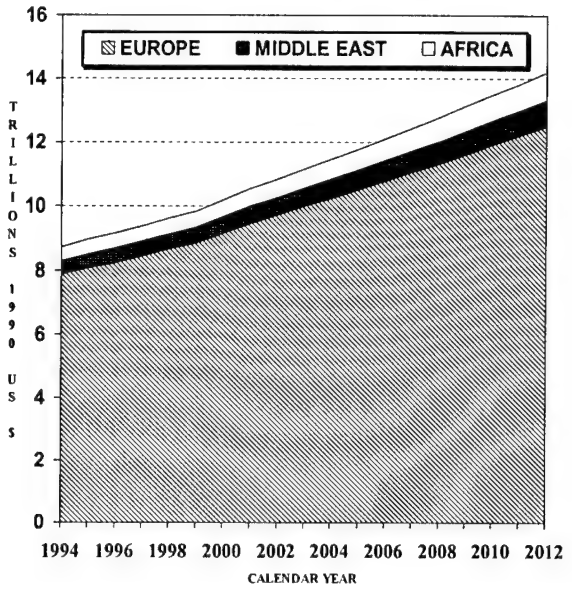
The Canadian economy showed substantial strength in 2000 as GDP grew by an estimated annual 4.7 percent. The economy is expected to slow in 2000 and 2001, averaging 3.2 and 3.0 percent, respectively. Over the 12-year forecast period, the Canadian economy is projected to increase at an average annual rate 2.7 percent. Although Canada continues to suffer high unemployment, strong GDP growth

GROSS DOMESTIC PRODUCT BY WORLD REGION

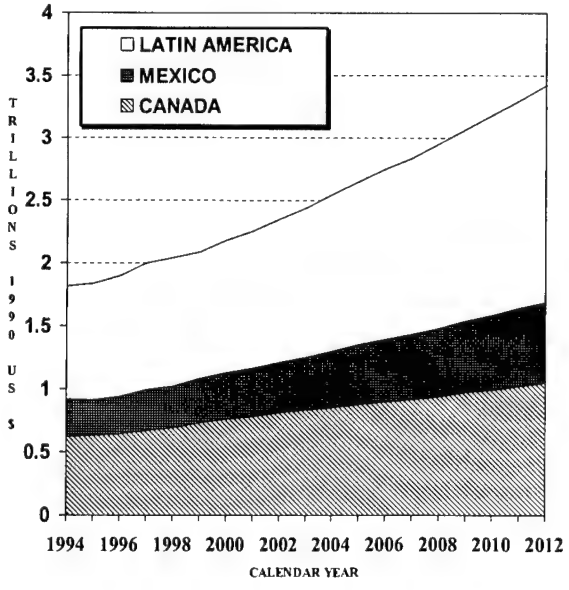
WORLD



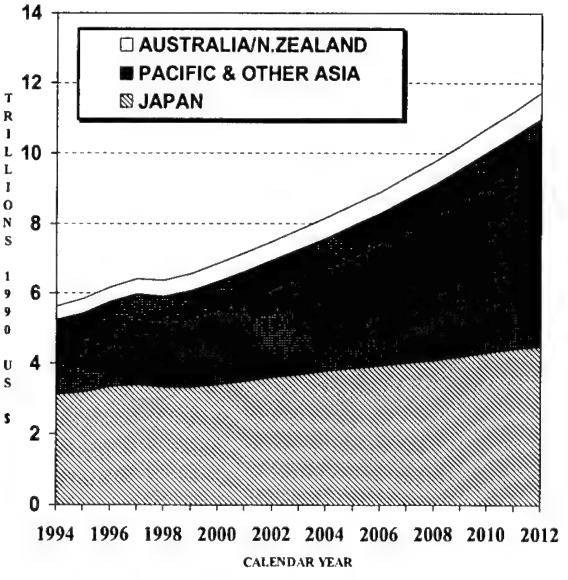
EUROPE/MIDDLE EAST/AFRICA



CANADA/MEXICO/LATIN AMERICA



JAPAN/PACIFIC & OTHER ASIA/AUSTRALIA & NEW ZEALAND



over the past few years has begun to reduce this excess capacity. Unemployment, currently at a 24-year low of 6.6 percent, is projected to continue to decline, reaching 6.3 percent by 2004.

Canada's Liberal Party, headed by Jean Chrétien, won national elections on November 27. The booming economy and pre-election tax cuts helped to cement the Liberal Party's victory. The substantial victory for Mr. Chrétien is expected to provide stability for Canada.

With a relatively low likelihood for further U.S. FED interest rate increases, the Canadian dollar has begun to strengthen against the U.S. dollar. Under these conditions, the Bank of Canada is less likely to raise its short-term rates. This positive monetary policy development along with a stable political environment bodes well for continued growth.

Perhaps the most important development for Canada has been the substantial tax rate cut announced by the Canadian government in its February 2000 budget. The federal government added to this tax relief in an amended budget in October 2000. In addition, most provinces have announced local tax reductions. These needed tax reductions should continue to spur economic growth in Canada.

Pacific/Far East

Asian countries (Japan, developing nations of the Asia Pacific, China, India, and Pakistan), along with Australia and New Zealand, are forecast to expand by 4.6 and 4.7 percent over the next 2 years. The 4.3 percent growth recorded in 2000 secured the region's economic turnaround after a severe economic downturn in late 1997 and 1998. Although economic activity In Japan grew by only 2.1 percent in 2000, the combined economies in developing Asia expanded at a relatively high rate of 7.0 percent.

Japan's economy, which accounted for about 53.5 percent of Asia's output in 2000, grew by 2.1 percent in 2000, up substantially from growth of only 0.3 percent a year earlier. The world's second largest economy is projected to continue in its recovery phase over the next 2 years, with GDP expanding by 3.1 percent in both 2001 and 2002. Over the 12-year forecast period, Japan's economy is projected to increase by 2.4 percent annually.

After a solid year of economic growth, Japan appears headed for a sustained period of economic expansion. Domestic goods and services demand and net exports have contributed to Japan's growth over the past year. Japan has also begun to modernize its business sector. For instance, law suits by shareholders against two construction companies for misappropriating funds demonstrates a move toward greater accountability of Japanese firms. Also, close bonds between Japanese firms and their creditors, which had presented a major obstacle to restructuring, appear to be lessening. This new business climate was exemplified by the recent bankruptcy of a major insurance group. The company's collapse came after its main creditor, Tokai Bank, refused to continue supporting the group.

Serious problems within the Japanese banking sector continue to plague the economy. For instance, the recent suicide of the new Aozora Bank president has been blamed on the bank's massive real estate bad debt. The Bank of Japan estimates that Japanese banks have written off 60 trillion yen in bad loans over the past 10 years. However, private analysts estimate that the banking sector may need 3 or 4 years to write-off the backlog of bad loans caused by the collapse of the real estate "bubble" a decade ago.

For the countries of Pacific and developing Asia, Pacific Basin countries, China, India, and

Pakistan, the financial crisis of 1997 and 1998 appears to be a fading memory. Developing Asian economies are expected to grow by 6.4 percent in 2001. The combined GDP of these countries is projected to more than double during the forecast period, increasing from $3.0 to $6.5 trillion, an annual growth rate of 6.8 percent.

China continued to expand at a rapid pace, although somewhat slower than during the early 1990s. Between 1990 and 2000, Chinese GDP grew at an annual average rate of 9.9 percent. In 2000, China grew by a somewhat slower 7.7 percent pace. Economic expansion is expected to continue at this lower rate for the next 2 years, growing 7.5 and 7.6 percent in 2001 and 2002. Over the 12-year forecast period, China's output is expected to grow from $995 billion to $2.4 trillion, a growth rate of 7.7 percent annually.

As in all developing area forecasts, the Asian outlook has substantial risk. Mainland China confronts the risks of slower growth because of massive inefficiency in state owned enterprises. Thailand, Indonesia, and the Philippines continue to struggle in the post-financial crisis period. In Thailand and Indonesia a restructuring of their banking and financial sectors, while improving, still needs much reform. Indonesia and the Philippines also continue to suffer low-level violence that poses an obstacle to further development.

Latin America

South America has lifted itself out of recession in 2000, with GDP growing by 3.7 percent after declining by 0.8 percent a year earlier. The Brazilian economy, producing more than half of the South America's GDP, appears to have recovered from last year's currency devaluation and high interest rates. Argentina, Latin America's second largest economy, continues to struggle its way out of recession as it attempts reduce public sector costs. Argentine growth is projected to reach 4.0 percent next year. Mexico's long-term economic outlook appears to have brightened with the July election victory by Vicente Fox and his opposition party over the establishment government. Fox's landslide victory has eased investors' jitters causing a rally on the peso.

Growth in South America is projected to continue to improve at a pace of 4.5 and 4.4 percent over the next 2 years. Over the forecast period, South America is forecast to grow at an annual rate of 4.2 percent. In Mexico, GDP is expected to rise 4.4 percent in 2001 and 4.9 percent in 2002. Over the forecast period, Mexico is projected to expand at an annual pace of 4.7 percent.

Several risks haunt South American economies. These troubling elements take the form of needed changes to the political systems and institutions. For instance, in Argentina, Congress passed a resolution annulling the decree of "necessity and urgency" used by the government to decrease civil service pay and reduce the high cost of government. With upcoming elections this year, needed social security system reforms in Brazil will likely go untreated.

While note expected, increases in interest rates by the U.S. FED, if they occur, pose a risk to the Mexican economy. Further increases could threaten the stability of the peso and lead to higher Mexican interest rates. The stability of the peso is particularly important since the export sector provides the engine for the current economic expansion.

Europe/Middle East/Africa

Together, the continents of Europe and Africa, along with the countries of the Middle East,

produced 37 percent of world output in 2000.[5] Over the next 2 years, these economies are projected to grow by 3.3 and 2.9 percent. Over the forecast period, this area is forecast to grow 2.8 percent, more than a half percentage point below the rate for the world in total. Western Europe, responsible for 88 percent of this region's GDP, is expected to grow by 3.2 and 2.7 percent in 2001 and 2002. For the 12-year period, Western Europe will grow by an average 2.6 percent a year.

Europe's economy depends on the actions of the European Union (EU), Eurozone or the European Monetary Union (EMU), and the European Central Bank (ECB). The EU consists of 15 countries that include Denmark, France, Germany, Italy, Spain, Sweden, the U.K, and others, while the EMU includes countries of the EU with the exception of Sweden and the U.K. The ECB has mounted a campaign against inflationary pressures which threatens economic development of the EU. Inflationary forces originate from several factors including rising fuel prices and a decline in value the EMU currency unit, the euro. These concerns brought on an interest rate hike by the ECB in October of 25-basis points and financial analysts anticipate yet further rate hikes.

The fall in the value of the euro has help to spur a rise in the European export sector. Exports rose by 15.5 percent in 2000. However, rising incomes have stimulated imports, lifting imports by slightly more than exports--to 15.8 percent--leaving trade in the EU as a mild drag to GDP growth.

Persistently high fuel prices present a significant risk factor in the EU forecast. High fuel prices, lower consumer demand, and increased costs to businesses cause an increase in product prices. The net effect is a decrease in GDP growth.

[5] The countries of the former Soviet Union are not included in the data for this area.

The developing economies of the Middle East countries expanded at a 6.4 percent pace in 2000. This strong growth resulted from the rapid rise in oil prices. In 2000 and 2001, the Middle East is forecast to increase at an annual rate of 4.3 and 4.1 percent. For the forecast period, the Middle East economic growth is projected at 4.1 percent per year.

Reduced oil production by OPEC and some non-OPEC countries, along with the increasing demand for oil by economically recovering Asian economies, have sustained an increase in oil prices. However, political stability of the Middle East remains a substantial problem. The failure of peace efforts between Israel and its neighbors, along with continuing violence in the West Bank and Gaza, provide substantial risk to the economic stability of the region.

The combined economies of Africa, including South Africa, are forecast to expand at an average annual rate of 4.4 percent over the forecast period. GDP growth in Africa is forecast at 4.3 percent in 2001, rising to 4.7 percent in 2002. Political stability and commodity prices play a central role in African growth. In North Africa, higher oil prices and improved tourism has helped to boost growth. The maintenance of relative political stability and high oil prices suggest a basis for continued growth for African nations.

The economies of Eastern Europe—including Hungary, Poland, the Czech Republic, and others—expanded at a rate of 3.9 percent in 2000. The economies of the two major countries of Eastern Europe--Poland and Hungary--grew by 5.2 and 5.7 percent, respectively. The third largest country in this block, the Czech Republic, recovered from 2 years of decline in 2000, with GDP up by 2.2 percent.

Eastern Europe is forecast to grow at by 4.5 and 4.6 percent in 2000 and 2001. Poland and Hungry each will expand GDP at 5.0 percent and above. Over the next 12 years, Eastern

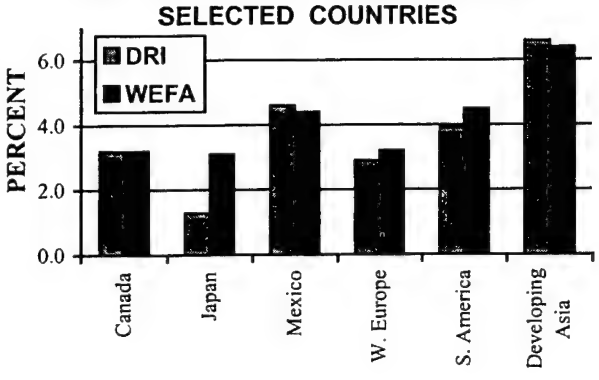
Europe is forecast to grow at an annual rate of 4.7 percent.

Potential Risks to the Forecast

World GDP growth, projected at 3.8 and 3.6 percent in 2001 and 2002, only has a 20 percent chance of slowing significantly, according to WEFA estimates. Important risks to the world forecast include rising interest rates in the United States by the FED and in Europe by the ECB. An additional risk comes from major equity market adjustments since a significant decline in the stock market can influence both consumer and business confidence. Although substantial weaknesses persist in some Asian and Latin American countries, the generally upbeat economic climate should keep individual country problems from spreading.

Individual countries imparting additional risk to the world economic forecast include Argentina and Japan. Argentina confronts weak investor confidence, a substantial fiscal deficit, and unemployment in the 15 percent range. Japan faces rising corporate bankruptcies and a need to restructure its business towards more productive enterprises. Unfortunately, this comes at a time when banks have little liquidity because of the large number insolvent borrowers.

With the exception of Japan, DRI is projecting economic growth in 2001 comparable to that forecast by WEFA. Although the WEFA forecast shows substantially larger growth for Japan, both major forecasting corporations foresee some growth in the world's second largest economy.



DRI, WEFA definitions for W. Europe, S. America, and Developing Asia differ, but each includes the major countries in the region.

DOLLAR EXCHANGE RATE

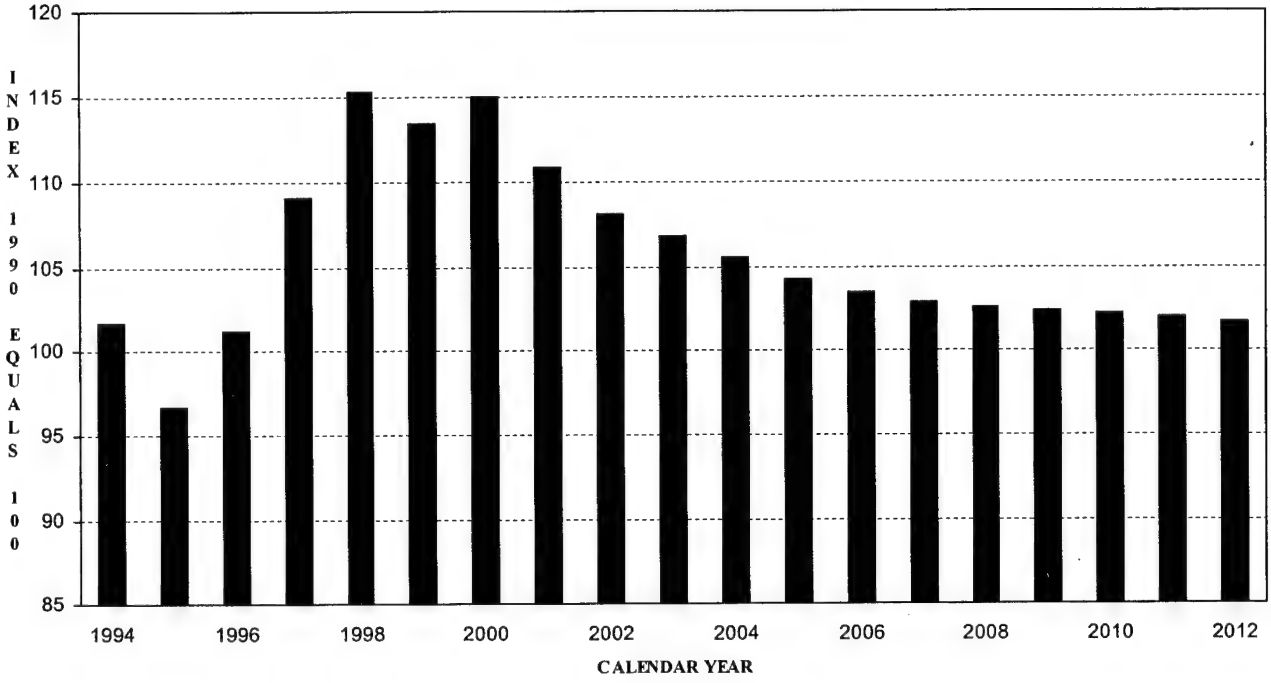
The graphic on the following page shows historical and forecast values for the U.S. trade-weighted nominal exchange rate index with other developed countries. The trade-weighted exchange rate measures the relative purchasing power of the U.S. dollar against economically developed countries after accounting for trade differences. The graph also displays the historical and projected dollar exchange rates against the Japanese yen and the European Union euro.[6] Table 5 in Chapter X displays the historical and forecast exchange rates from 1994 to 2012 for the Canadian dollar, European Union euro, the British pound, the German mark, and the Japanese yen.

In trade-weighted terms, the dollar rose against its major trading partners in 2000. However, the purchasing power of the U.S. dollar is projected to fall throughout the 12-year forecast period, declining at an average annual rate of 1.0 percent. The U.S. dollar depreciated slightly against the Canadian dollar in 2000, to

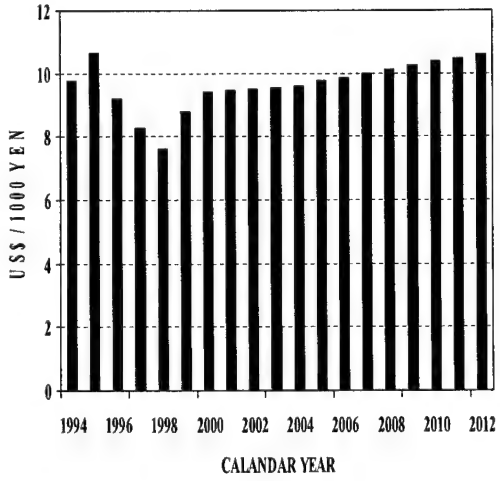
[6] Note: A rise in the index implies an appreciation of the dollar against other currencies; a decline in the euro or yen also implies an appreciation of the dollar against these currencies.

EXCHANGE RATE TRENDS AND FORECASTS

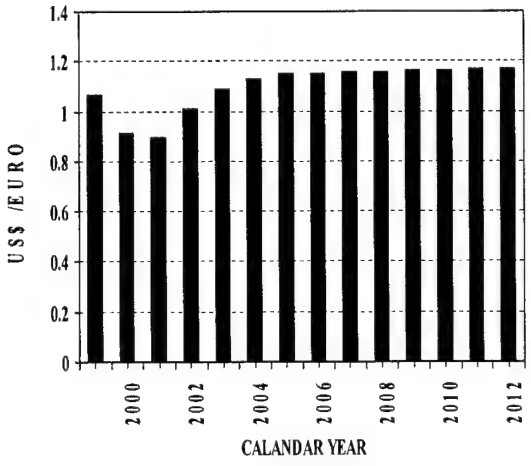
U.S. TRADE-WEIGHTED EXCHANGE RATE
(NOMINAL RATE WITH OECD COUNTRIES)



JAPANESE YEN



EUROPEAN UNION EURO



$0.68 U.S. The Canadian dollar is expected to continue to rise throughout the forecast period, increasing to $0.74 U.S. by 2012.

The European Union euro, the official currency of the EU, depreciated significantly against the U.S. dollar in 2000, requiring $0.914 to purchase a euro compared to $1.065 a year earlier. The euro is projected to increase by 2.1 percent annually over the forecast period, totaling $1.17 in 2012. The Japanese yen rose to a level $9.402 per 1,000 yen (106.36 yen to $U.S.) from a level $8.782 (113.87 yen to $U.S.) a year earlier. The yen is expected to rise to $10.612 (94.23 yen to $U.S.) by 2012.

OTHER ISSUES

The New Economy

The world is undergoing a phenomenal revolution in information technology (IT). Illustrative examples abound. Today's new middle-of-the-road cars contain more computing power than mainframe computers of the Apollo space program. Thirty years ago it would have cost $187 to electronically transmit the "Encyclopedia Britannica;" today, it costs approximately $40 to transmit the equivalent of the entire contents of the Library of Congress across country. Increasing bandwidth and plunging information costs are rapidly changing the way the world communicates and does business.

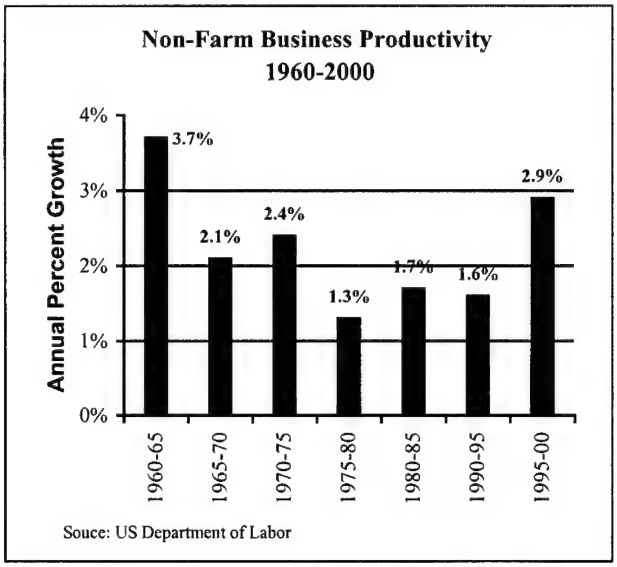
Use of computers and the internet offer corporations a variety of means to reorganize the way they do business, including better inventory bookkeeping, vastly improved procurement procedures, and methods to decentralize and outsource work. Information technology can boost efficiency in activities as diverse as product design, product marketing, and cost accounting. Efficiencies are found in all business types, including manufacturing, finance, services, and transportation.

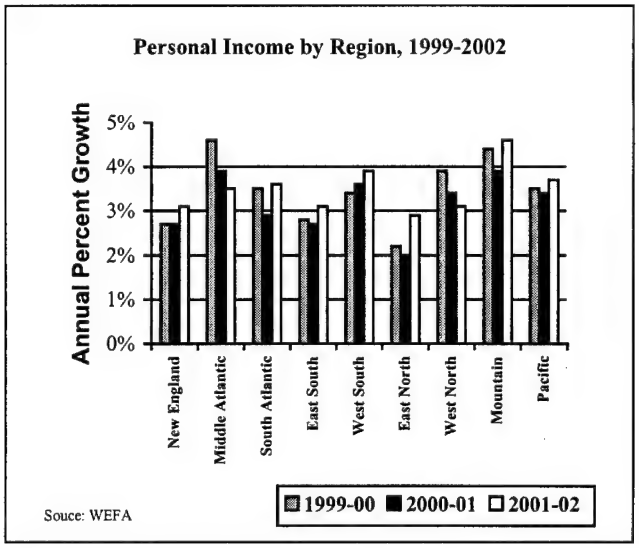
Procurement costs, for instance, fall with the use of enhanced IT because finding the lowest price becomes much easier and placing online order takes less staff time. Distribution costs may also fall for many industries. For example, goods and services in industries such as software, financial services, and many others can provide access to products or product information online. Manufacturers and sellers of durable and non-durable goods alike, including all aspects of the aviation industry, have more efficient market transactions with developing IT.

Commercial aviation uses IT in every aspect of business, from tracking sales to preserving maintenance records. A particularly exciting use of IT is the e-ticketing. The use of e-ticketing allows airlines to circumvent traditional travel agent fees, which not only reduces costs and increases profits. It may also lower fares below the cost of tickets obtained through normal distribution channels.

Sizeable business investment in IT has begun to pay off with rapid gains in productivity. For several years in the late 1980s and early 1990s, an apparent paradox was that business investment in IT, in the form of computers and peripheral equipment, did not produce expected productivity enhancements.[7] The U.S. economy has begun to experience these gains. The following chart shows the average productivity gains over 5-year periods from 1960 forward. Productivity gains remained under 2 percent for the entire period 1975 to 1995. Since 1995, however, average yearly productivity gains have jumped to almost 3 percent as more businesses implement IT methods and equipment.

[7] Robert J. Gordon argues that most of the productivity gains from IT investment have occurred only in the durable goods manufacturing sector that accounts for only about an eighth of total output. (Does the "new Economy" Measure up to the Great inventions of the Past?, Journal of Economic Perspectives—Fall 2000 pp. 49-74)





Regional Dispersion of Growth

Even as U.S. economic growth continues to expand on a steady course, regional economic growth varies substantially. Regional growth in income and employment provide reasonable indicators of market strength and potential for aviation growth. The following graph shows income growth by region for the period 1999 to 2002. WEFA, the source of this data, expects average U.S. income (in 1996 dollars) to increase by 3.2 and 3.4 percent in 2001 and 2002, respectively.

Mountain states (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming) are expected to lead the nation in income growth with increases of 3.9 and 4.4 percent in 2001 and 2002. Among these states, Colorado has the most positive outlook with incomes projected to rise 5.0 and 5.4 percent over the next two years. The states of the East North (Illinois, Indiana, Michigan, Ohio, and Wisconsin--the country's aging industrial states) are forecast to have the slowest income growth over the next 2 years.

The following table shows the top 10 metropolitan areas ranked by annual employment growth from 1999 to 2002. Two of America's premier tourist resorts, Las Vegas and Orlando, are among the top three metropolitan areas in expected employment gains. With the exception of Denver, all of these rapidly growing urban centers lie within the Sunbelt.

Table II-1

Top 10 Metropolitan Areas in Employment Growth 1999 - 2002

Metropolitan Area	1999 Employment (000s)	1999-02 Growth (%)
Orlando, FL	880.9	4.0
Austin-San Marcos, TX	633.5	4.0
Las Vegas, NV-AZ	714.4	3.9
West Palm Beach, FL	472.2	3.5
Tampa, FL	1157.0	3.4
Phoenix-Mesa, AZ	1524.5	3.3
Sacramento, CA	686.7	3.3
Denver, CO	1137.4	3.2
Orange County, CA	1345.1	3.0
Fort Lauderdale, FL	658.9	2.9

SUMMARY AND IMPACT ON AVIATION

The outlook for the U.S. economy is for stable economic growth in the short-term and continued healthy gains during the remainder of the forecast period. Fuel prices, after rising by nearly a third (29.5 percent) in 2000, are projected to rise by only 1.2 percent in fiscal year 2001 and to fall by 23.9 percent over the next 2 years. The outlook for this important input to the aviation industry operating cost equation shows real fuel prices declining at an annual rate of 3.3 percent over the next 12 years.

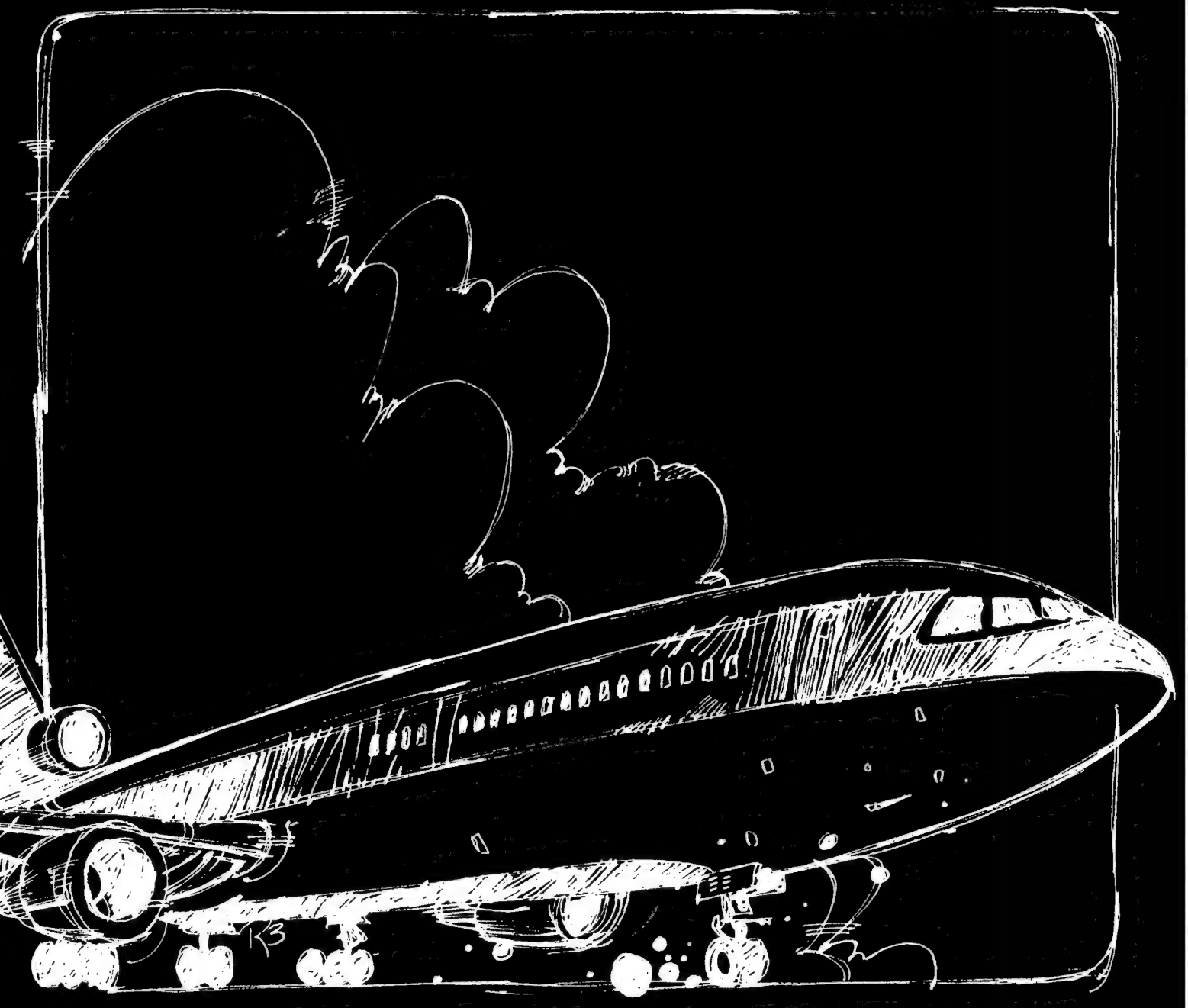
Economic activity worldwide has picked up its pace and is expected to grow at a relatively rapid rate over most of the forecast period. The few clouds in the forecast are scattered and appear unthreatening. World GDP growth is forecast at 3.4 percent over the 12-year period and WEFA assumes only a 20 percent chance of world GDP slowing significantly in the short-term.

Small but real threats to the world GDP forecast come from rising interest rates in the U.S. and Europe. Also, major equity market adjustments could alter consumer and business confidence in the near-term. Although weaknesses continue in some Asian and Latin American countries, the generally favorable economic climate should keep these isolated problems from spreading.

The FAA aviation forecast presented here anticipates continued stable growth accompanied by moderate inflation and declining real fuel prices. Under these conditions, both U.S. domestic and international aviation markets should continue to thrive.

CHAPTER III

COMMERCIAL AIR CARRIERS



CHAPTER III

COMMERCIAL AIR CARRIERS

In fiscal year 2000 there were 87 U.S. commercial airlines (both scheduled and nonscheduled) reporting traffic and financial data to the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation (DOT), on Form 41. There were 62 passenger airlines (operating aircraft with over 60 seats) and 24 all-cargo carriers.

Forty-three of the airlines provided scheduled passenger service and constitute the focus of the air carrier forecasts (both domestic and international) discussed in this chapter. Forty-two of the carriers provided scheduled domestic service (within the 50 States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands), while 17 of the carriers provided scheduled international service. Of the carriers providing scheduled international service, eight served Atlantic routes, ten served Latin American routes, and seven served Pacific routes.

Air carrier traffic forecasts and assumptions discussed here are presented in Chapter X (Tables 6 through 22). FAA air carrier workload forecasts are discussed in Chapter VII and presented in Chapter X (Tables 32 through 45).

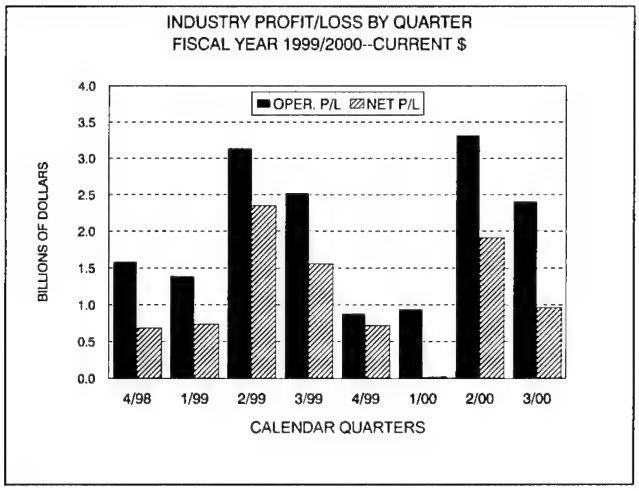
It should be noted that all specified years in the remainder of this chapter are fiscal years (October 1 through September 30), and specified quarters are fiscal year quarters, unless designated otherwise.

REVIEW OF 2000

FINANCIAL RESULTS

In 2000 operating revenues for the U.S. commercial airline industry exceeded operating expenses. This was the eighth consecutive year that operating revenues were higher than operating expenses. Since 1993, cumulative operating profits have exceeded $47.2 billion. The financial success of the industry in 2000 was based on strong growth in traffic and yields offsetting higher fuel and labor costs. Capacity growth in 2000 was well below that of traffic, resulting in an increase in system load factor of 1.4 points to a record 72.2 percent. Labor turmoil at United was one of the major contributors to slower capacity growth in 2000.

The industry operating profit was $7.6 billion in 2000. Although operating profit was down $1.1 billion in 2000, it was the fourth highest year for operating profit since deregulation.

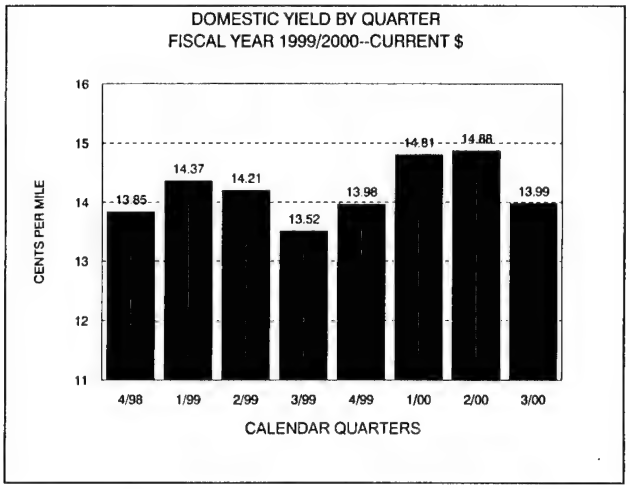


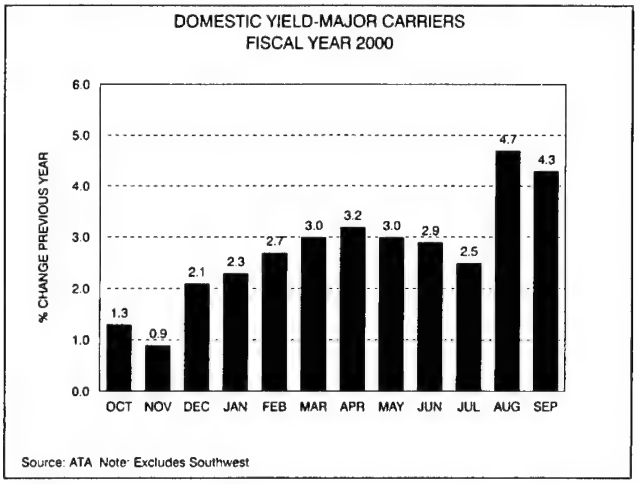
The industry had an operating profit in all four quarters. For the year, operating revenues increased 8.3 percent, while operating expenses increased 10.0 percent. By comparison, operating expenses were up 4.8 percent in 1999, 3.8 percent in 1998, and 5.7 percent in 1997.

The large increase in operating expenses in 2000 was largely due to a sharp increase in fuel costs. After declining 18.6 and 9.3 percent in the past 2 years, fuel prices rose an estimated 48 percent in 2000, escalating industry operating expenses by more than $4.8 billion.

Industry domestic nominal yields increased 3.2 percent, while yields, adjusted for inflation, increased 0.1 percent. Throughout much of the year, carriers have raised fares to offset rising fuel prices. However deep discounting by carriers in order to stay competitive and boost demand has offset much of the increase in posted fares. Competition in the industry is intense, and is expected to continue in both the domestic and international markets throughout the forecast period.

Nominal international yields also increased during the year. In the Atlantic real yields declined 1.9 percent while in Latin American and Pacific markets real yields increased 0.4 and 7.6 percent, respectively. The falling yields in the Atlantic markets can be attributed to supply side effects of increased competition and growth in capacity. The Latin region increase reflected a shift in the mix of traffic to higher yielding Caribbean destinations while the Pacific yield increase was due to an increase in the yen/dollar exchange rate and an increase in demand.

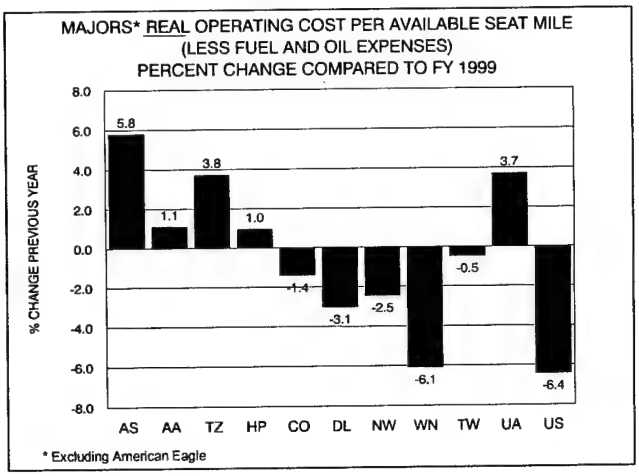


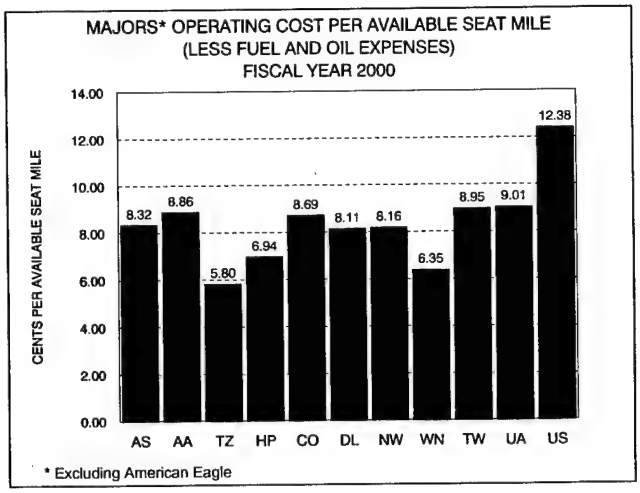


During 2000, six major passenger carriers reduced their real unit costs (estimated without fuel and oil expenses). US Airways had the largest decline--down 6.4 percent, followed by Southwest with unit costs declining 6.1 percent. Alaska showed the largest increase, with unit costs up 5.8 percent.

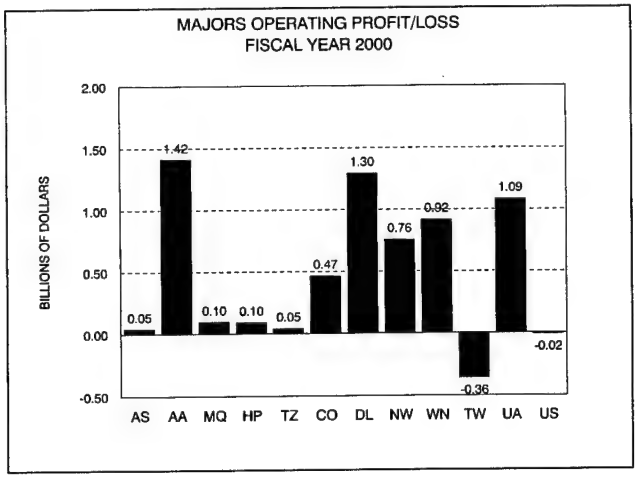
System average real operating cost per available seat mile (excluding fuel and oil) for the major passenger carriers was 8.64 cents in 2000, down 0.6 percent from 1999. System real unit costs (including fuel and oil) increased 3.3 percent. In 2000, American Trans Air had the lowest operating cost (excluding fuel and oil) per available seat mile (5.80 cents). The highest

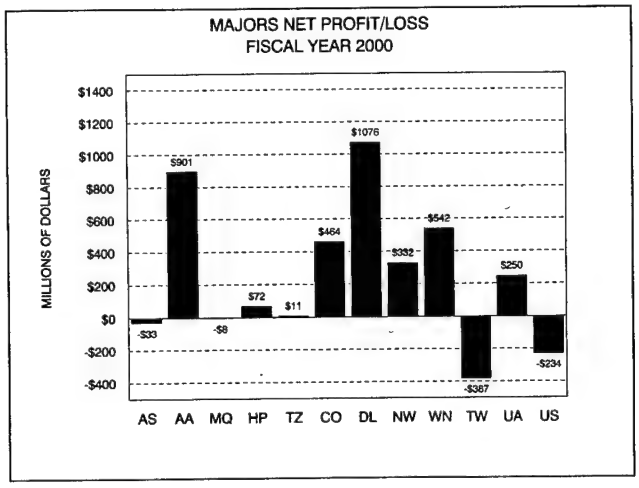
unit cost among the major network carriers was US Airways with 12.38 cents.[1]





recorded the highest operating and net profits of the major passenger carriers.





In 2000, U.S. airlines posted a net profit of $3.6 billion--$1.7 billion below that of 1999. Net profit between 1994 and 1998 period totaled $14.7 billion. Total net profit for the seven-year period was $23.6 billion.

The following two graphs show operating and net profit and loss for the 12 major passenger air carriers.[2] Of the 12 carriers, 10 had operating profits in 2000 while TWA and US Airways, recorded operating losses of $364.1 million and $15.0 million, respectively. American and Delta

During the next several years, competition, capacity expansion, and productivity gains in the industry are expected to push real yields downward. Falling yields plus economic growth will continue to expand aviation activity and increase passenger revenues. Cost control will be key to the industry's ability to sustain profits at a relatively high level throughout the forecast period.

SCHEDULED PASSENGER TRAFFIC AND CAPACITY

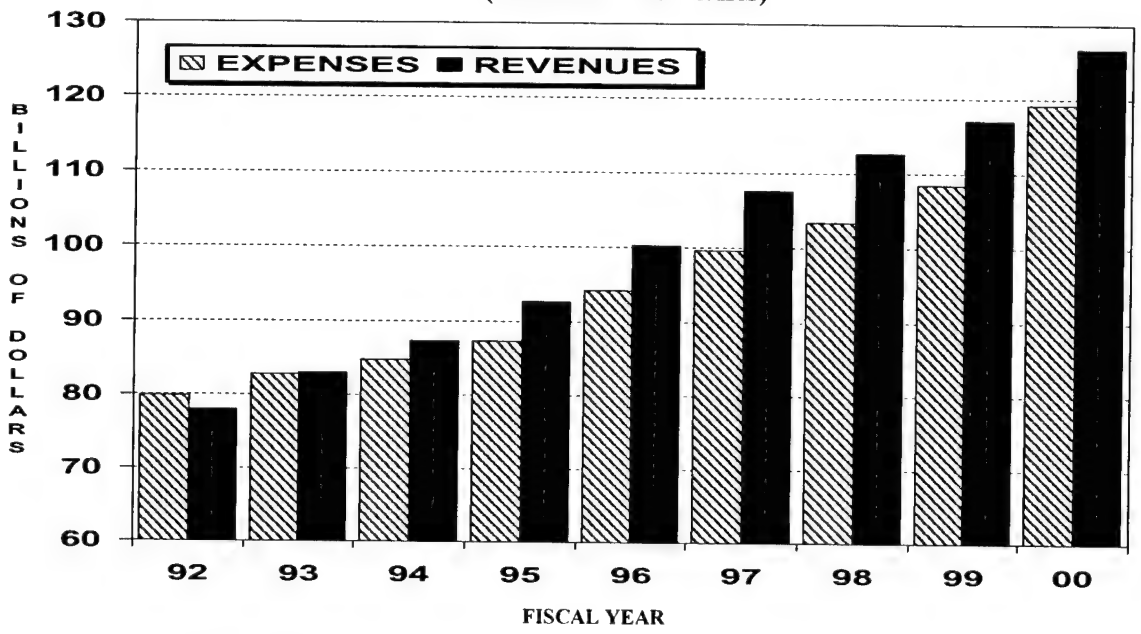
In 2000, total scheduled U.S. commercial air carrier activity (domestic plus international)

[1] Although American Eagle by definition is a major carrier, they have been excluded from this discussion, as their costs more closely resemble those of a commuter carrier rather than a network carrier.

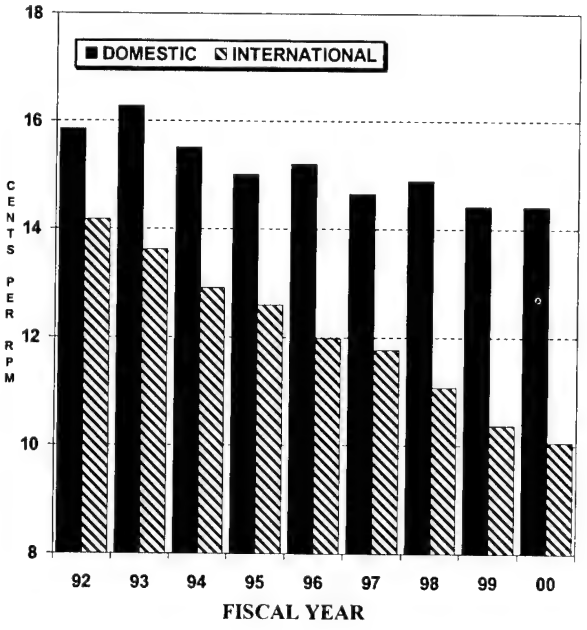
[2] Defined by the U.S. DOT as carriers with annual operating revenues in excess of $1B.

U.S. COMMERCIAL AIR CARRIERS: REVENUE AND COST TRENDS

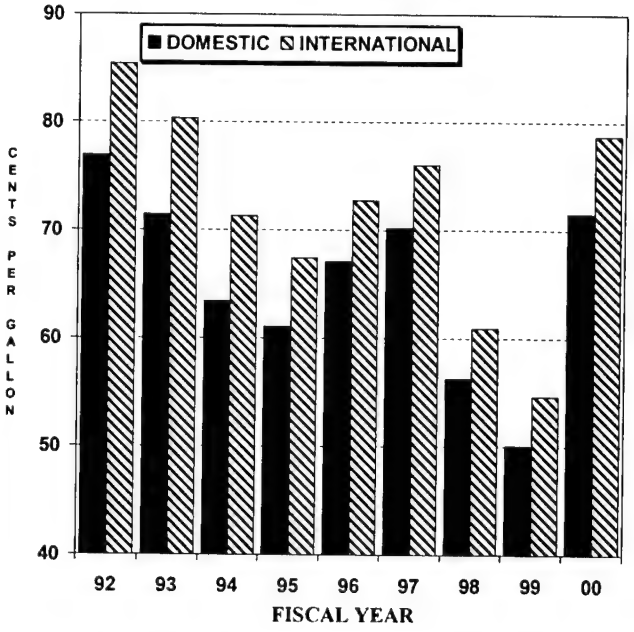
OPERATING REVENUES AND EXPENSES
(CURRENT DOLLARS)



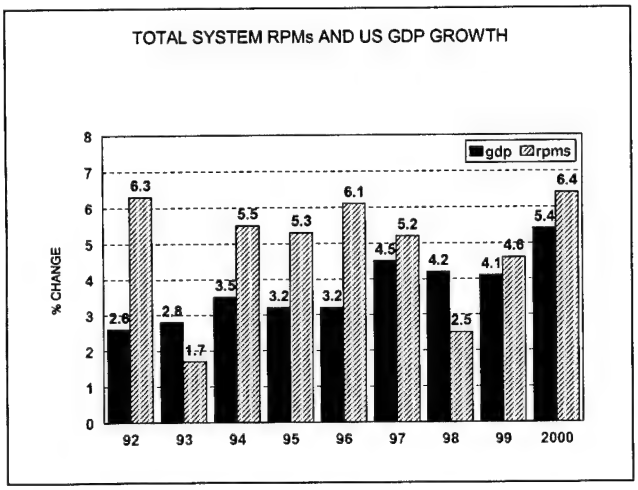
PASSENGER YIELDS
($2000)



JET FUEL PRICES
($2000)



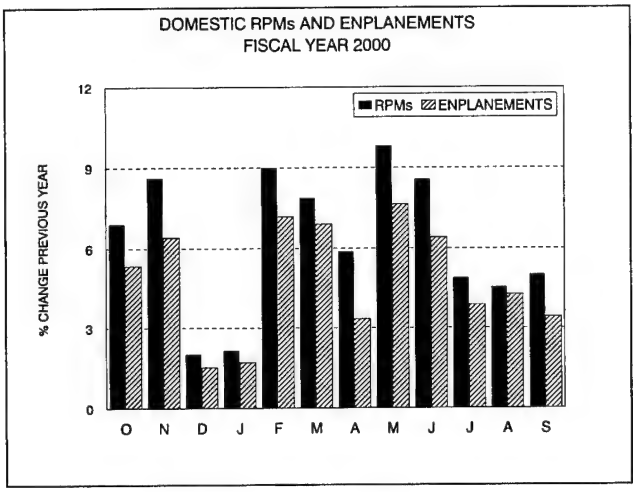
continued to grow at rates above those of the U.S. and world economies. In 2000, system revenue passenger miles (RPMs) increased 6.4 percent, while enplanements increased 4.7 percent. Since 1991, system RPMs have increased 4.8 percent a year--roughly 27 percent higher than the rate of growth of U.S. Gross Domestic Product (GDP) and 64 percent higher than world GDP growth, adjusted for inflation.

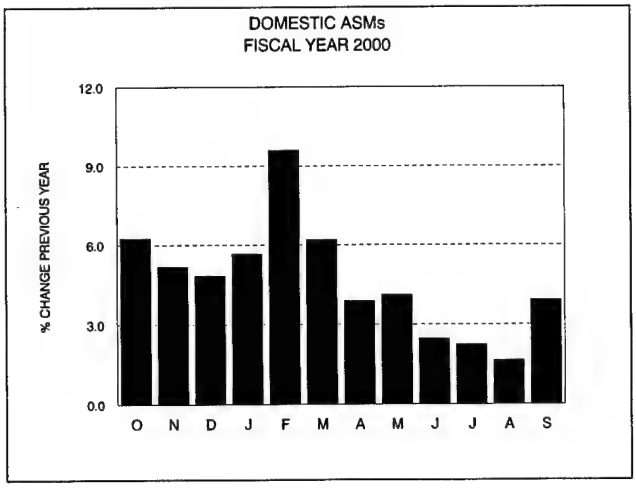


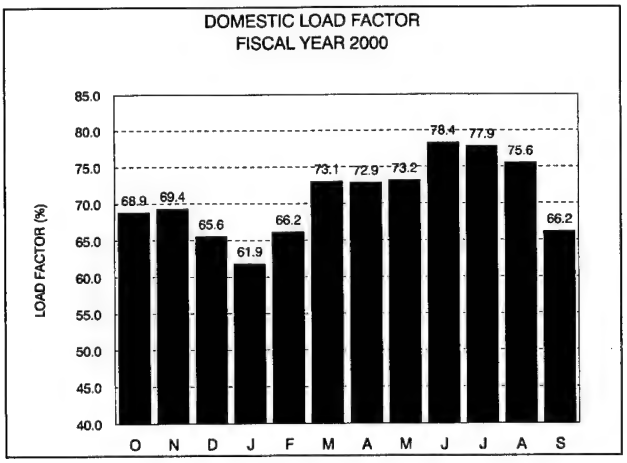
System available seat miles (ASMs) increased 4.4 percent in 2000, resulting in a load factor increase of 1.4 percentage points to 72.2 percent--the highest figure ever. Since 1991, the system load factor has increased 9.9 percentage points.

Domestic Passenger Traffic and Capacity

In 2000, a strong economy and flat real yields pushed RPMs and enplanements up 6.3 and 4.9 percent, respectively. Growth was consistently strong throughout the year, except in December and January reflecting the impact of the Y2K effect. Although capacity grew at a relatively rapid pace, 4.6 percent, the load factor increased by 1.1 percentage points to an all-time high of 70.9 percent. Since 1991 the domestic load factor has increased 10.1 percentage points.

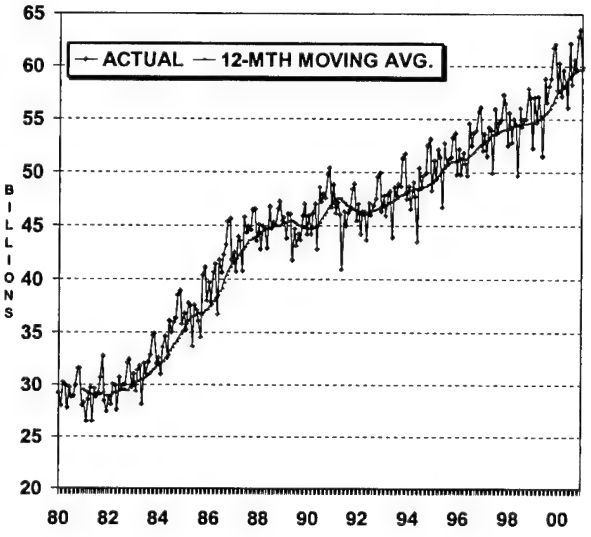






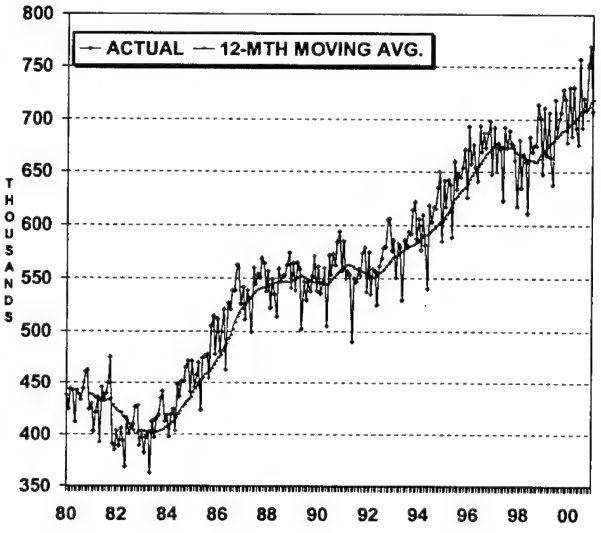
U.S. AIR CARRIER DOMESTIC TRAFFIC TRENDS

AVAILABLE SEAT MILES



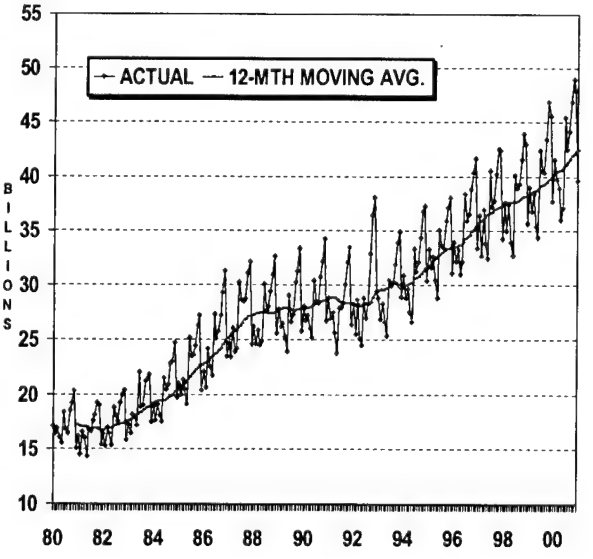
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



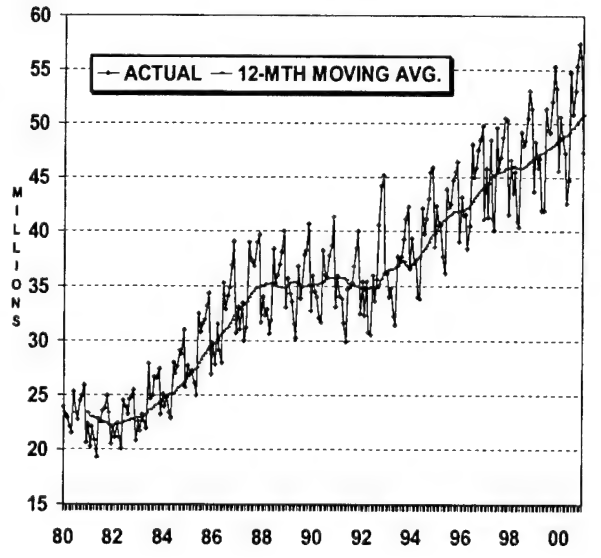
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

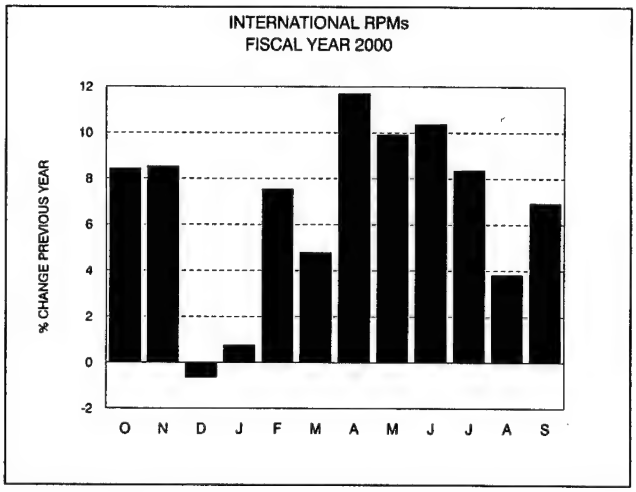
U.S. Air Carriers' International Passenger Traffic and Capacity

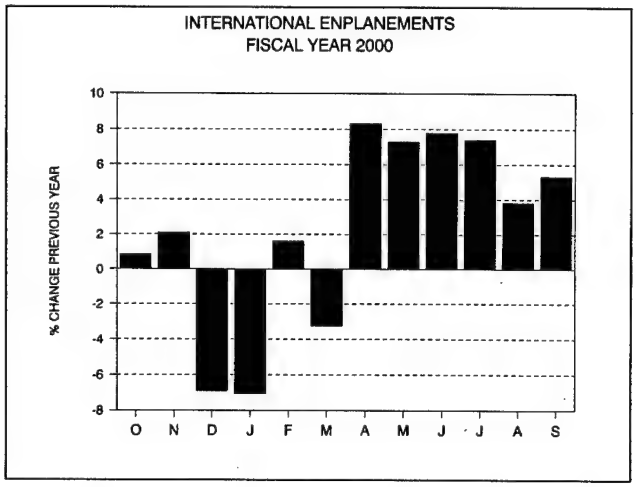
Strong world and U.S. economic growth in 2000, along with declining real fares in the Atlantic markets, drove total U.S. air carrier international traffic to record levels.

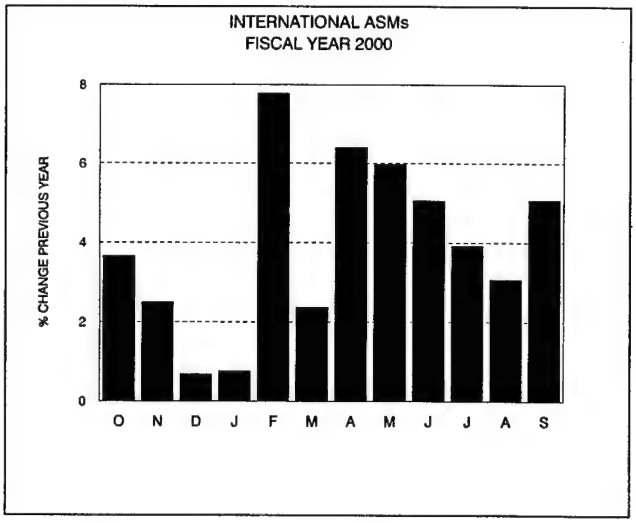
In 2000, total international RPMs increased 6.8 percent, the 9th consecutive year of growth and the highest growth rate since 1992. Enplanements also increased, up 2.4 percent, as strong growth in Atlantic markets more than offset continued declines in the Asia/Pacific markets. The growth in both RPMs and enplanements occurred despite the negative impact of Y2K on traffic during the December/January time frame.

Since the U.S. economic expansion began in 1991, international RPMs have increased 59.7 percent, while enplanements increased 37.3 percent. During the same period, domestic RPMs and enplanements increased 50.7 and 46.3 percent, respectively.

Total international ASMs grew 3.9 percent in 2000 as carriers continued to increase capacity rapidly in the robust Atlantic region. Capacity in the Asia/Pacific market increased slowly following 2 years of declines while capacity was flat in the Latin American market. Capacity growth in the Atlantic, Asia/Pacific, and Latin American markets was 7.1, 1.9, and 0.5 percent respectively.

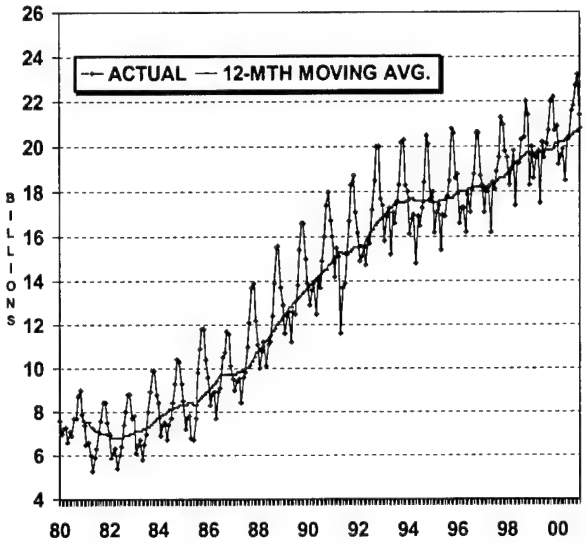






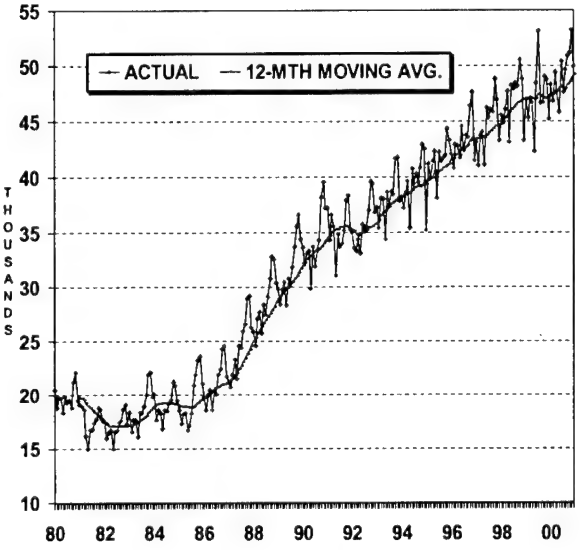
U.S. AIR CARRIER INTERNATIONAL TRAFFIC TRENDS

AVAILABLE SEAT MILES



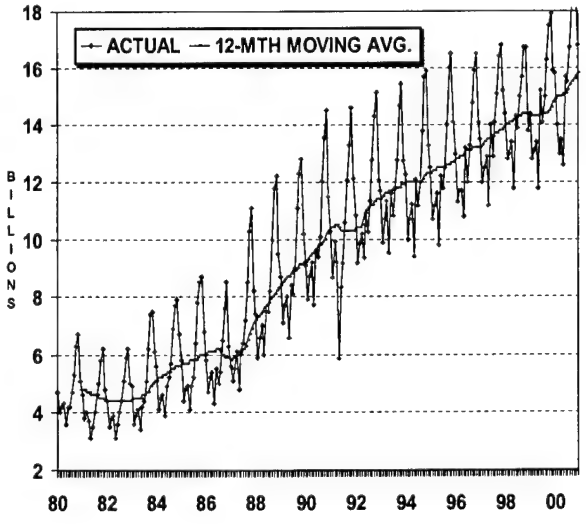
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



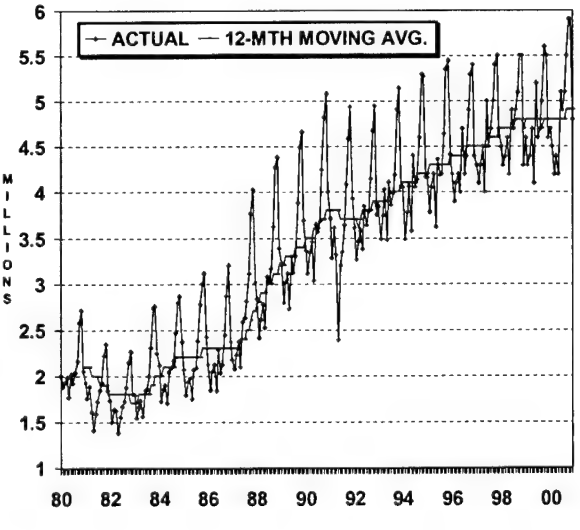
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

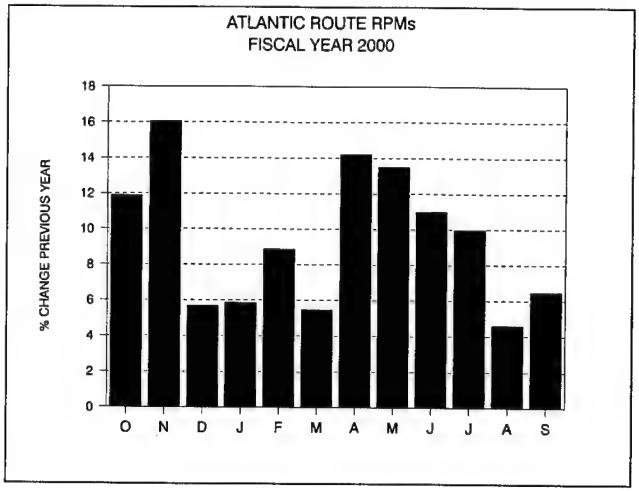
Atlantic Routes

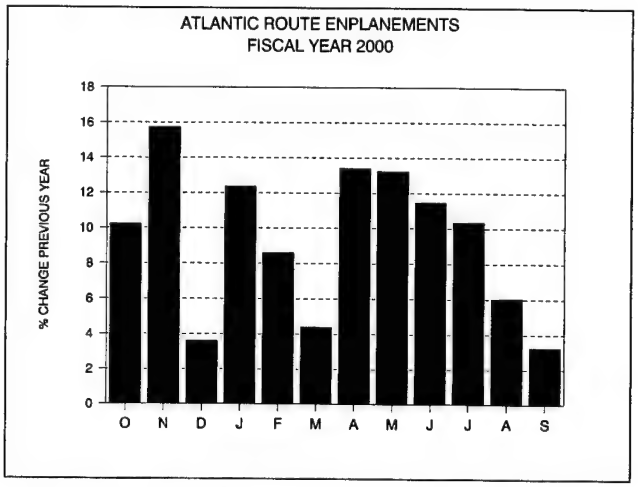
In 2000, transatlantic RPMs were up for the 9th consecutive year, increasing 9.5 percent from 79.6 million to 87.1 million. Enplanements were up 9.3 percent. Continued strong growth can be attributed to the strong economies in the U.S. and Europe, intense competition, and continued fare discounting.

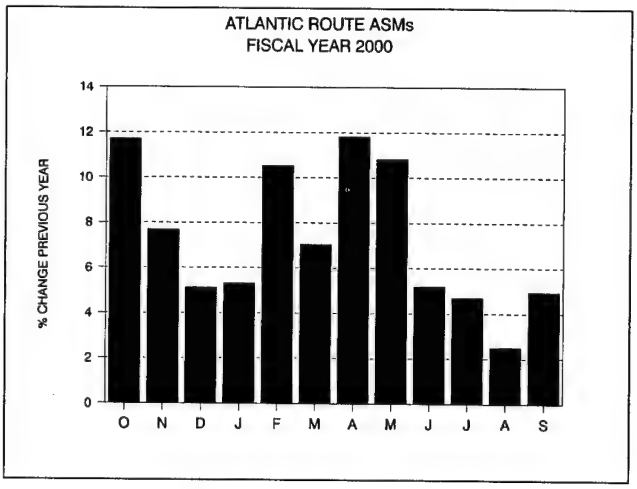
Following a decline in capacity between 1994 and 1997 of about 1.0 percent a year, ASMs have increased at an annual rate of 8.2 percent over the past 3 years. RPM growth since 1997 has averaged a healthy 8.5 percent driving the load factor up 0.5 points, from 78.7 percent in 1997 to 79.2 percent in 2000. Since 1991, the Atlantic load factor has increased 9.7 percentage points.

Immigration and Naturalization Service (INS) data, which is compiled by the U.S. Department of Commerce, showed that in CY 1999 U.S. flag carriers' market share in the region continued its steady decline, dropping 1.0 percentage point to 38.5 percent. U.S. flag carriers' market share peaked in 1988 at 48.5 percent.

In 2000 the U.S. passenger carriers serving the market had an operating profit of $634.3 million, making the Atlantic market the most profitable of the international regions. In 1999 the Atlantic market had an operating profit of $658.8 million.

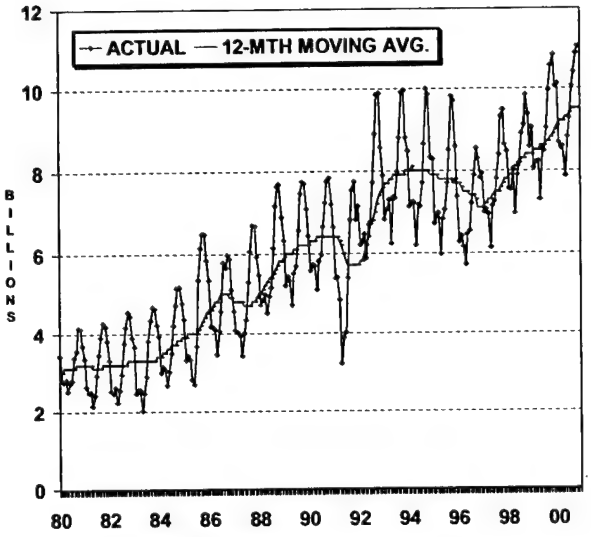






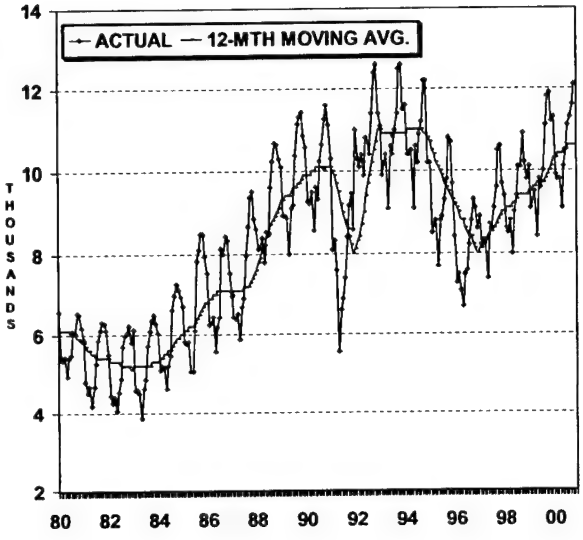
U.S. AIR CARRIER TRAFFIC TRENDS: ATLANTIC ROUTES

AVAILABLE SEAT MILES



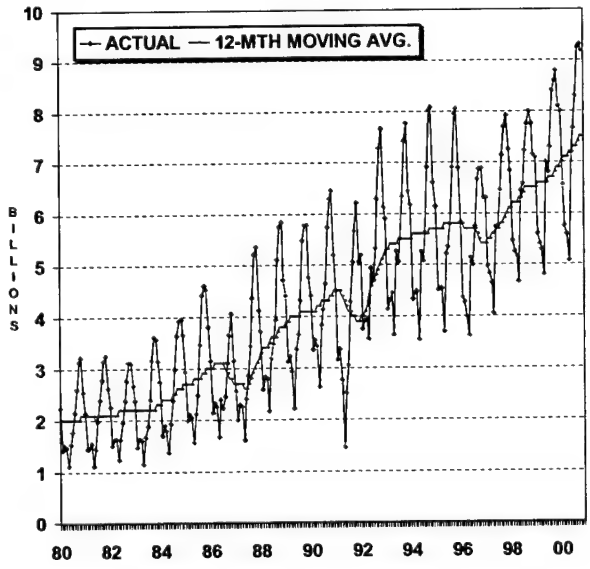
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



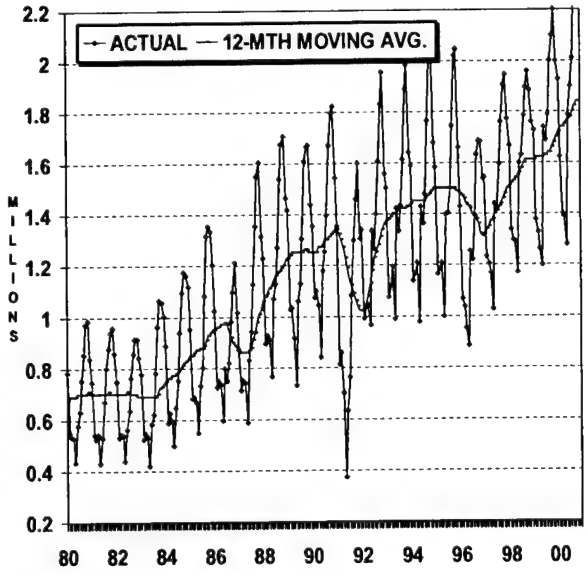
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

Latin American Routes

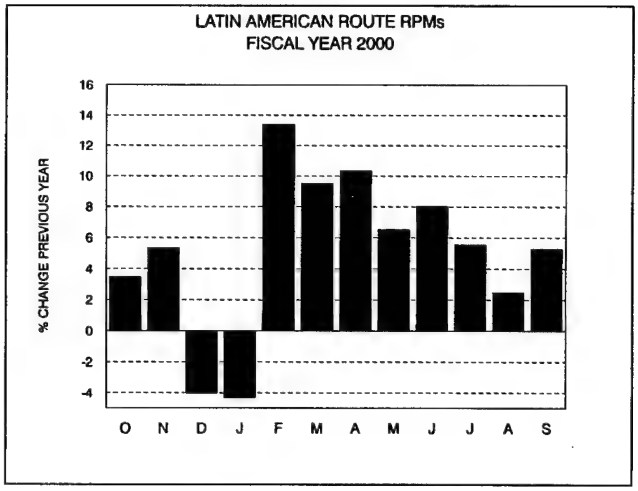
Traffic demand to Latin America (destinations in South America, Central America, Mexico, and the Caribbean) continued to grow, albeit at rates slower than in the recent past. In 2000, RPMs and passenger enplanements were up 4.9 and 2.8 percent, respectively. For the period 1991 through 2000, RPMs increased at an annual rate of 7.7 percent, while enplanements increased 4.8 percent a year.

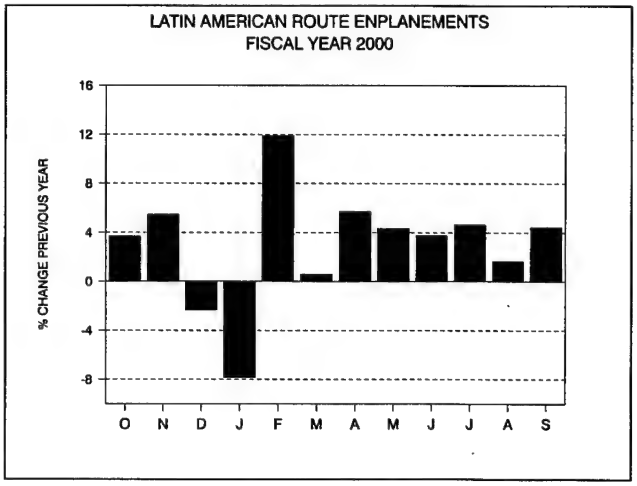
Expansion in traffic in 2000 was the result of a strong U.S. economy and mixed growth in Latin America. Slow capacity growth (up 0.5 percent) resulted in a load factor increase of 2.9 percentage points to 68.8 percent--a record high for the region.

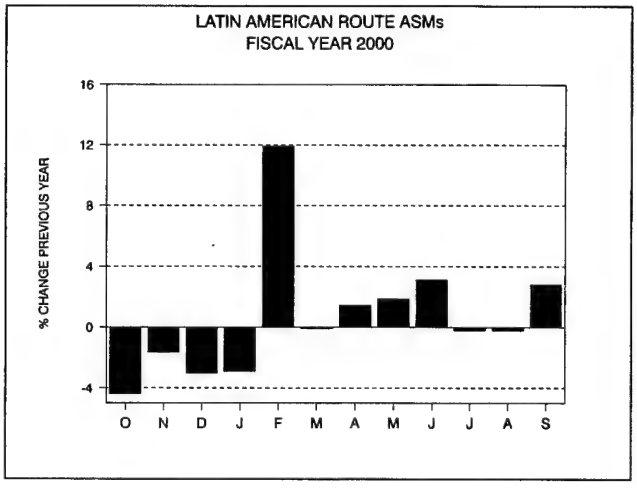
The continued expansion of U.S. carriers into deep South America--Argentina, Brazil and Chile—plus the expansion of service to the Caribbean from Northeast destinations increased the average trip length 2.1 percent (32.6 miles) in 2000. Since 1990, the average trip length has expanded 29.7 percent, or 364.4 miles, increasing from 1,227.3 miles to 1,591.7 miles.

The U.S. passenger carriers serving the Latin American market had an operating profit of $240.8 million, down 28.1 percent versus 1999.

The embracing of free markets in Latin America has resulted in the privatization and restructuring of Latin American carriers. Clearly, these industry changes along with the move towards open-skies agreements will pose additional challenges for the U.S. carriers over the next several years.

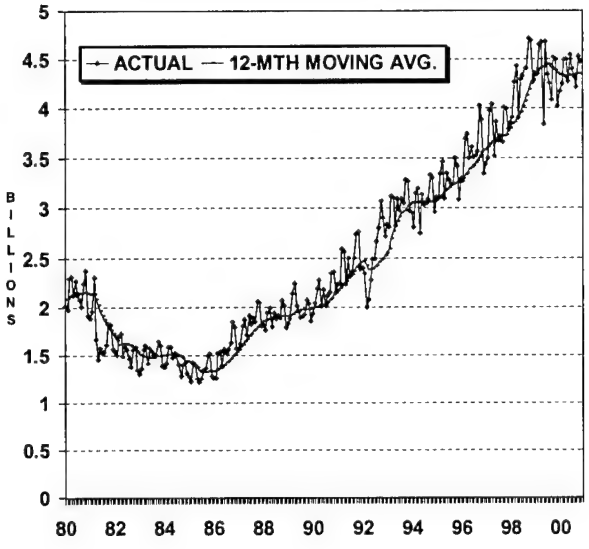






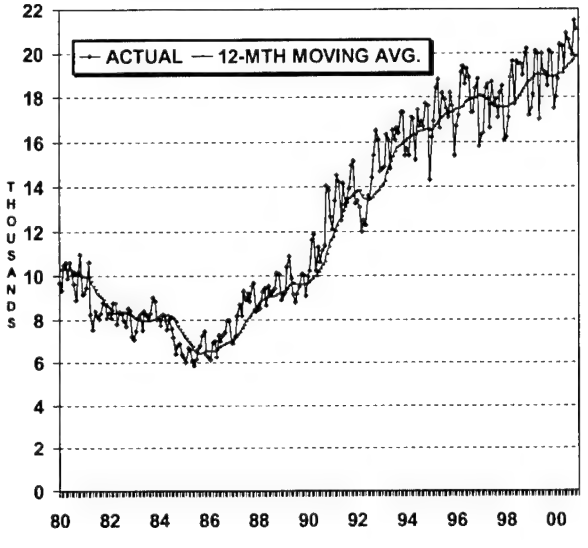
U.S. AIR CARRIER TRAFFIC TRENDS: LATIN AMERICAN ROUTES

AVAILABLE SEAT MILES



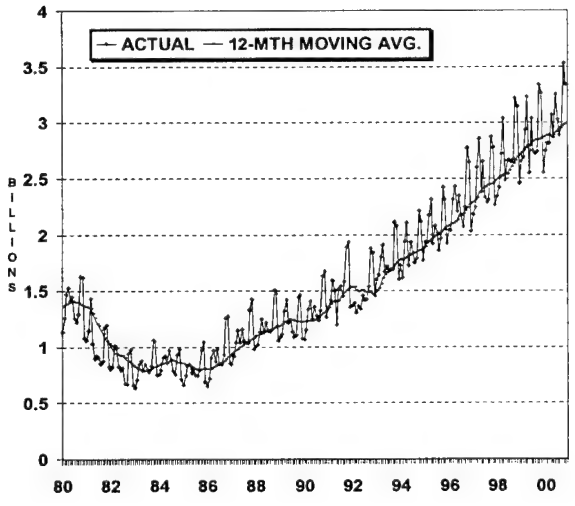
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



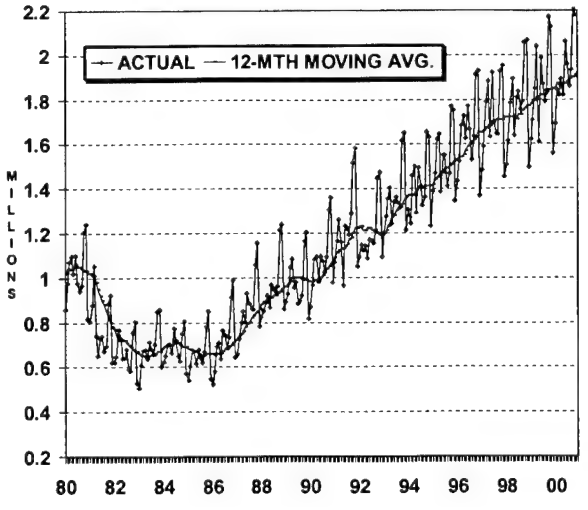
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

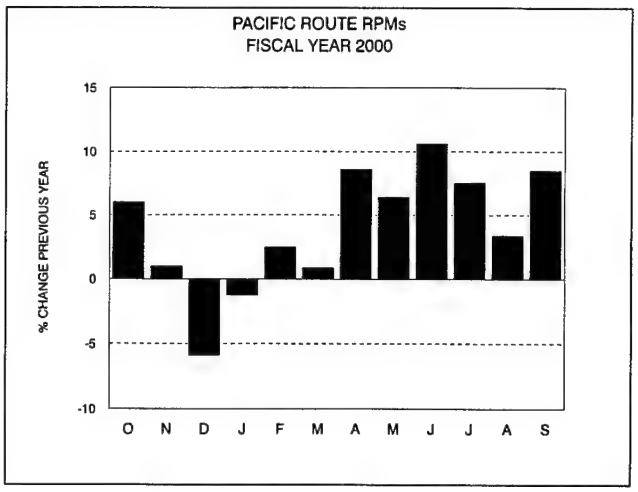
Pacific Routes

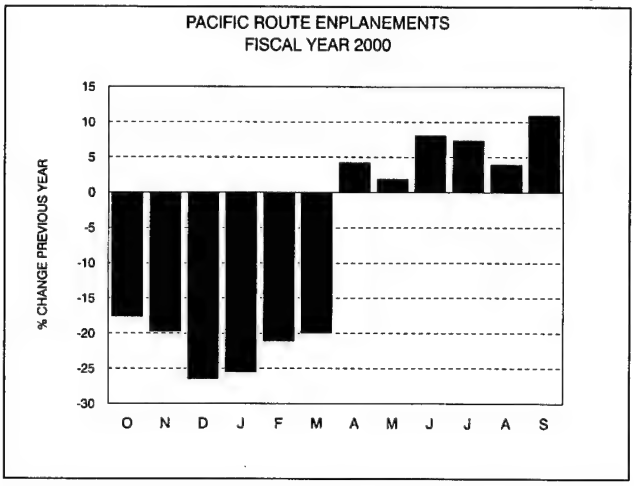
Following 2 years of declines, traffic in Asia/Pacific markets increased modestly in 2000, with RPMs up 4.2 percent over 1999. The region's continued recovery from the financial and economic crisis of 1997/98 plus the strong U.S. economy were the principle drivers of the growth. Enplanements continued to fall however, down 8.9 and 12.8 percent in 2000 and 1999, respectively. These large declines are the result of a significant restructuring of the regional route networks in April 1999.

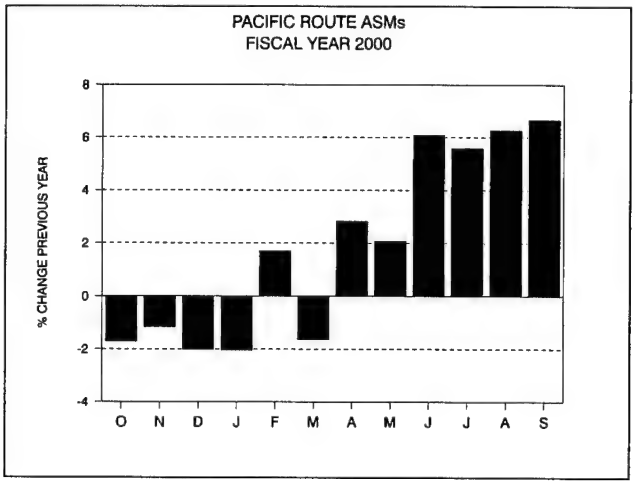
After 2 years of declines U.S. flag carrier ASMs increased by 1.9 percent as carriers began to slowly add capacity back to the region. The slow growth in ASMs, coupled with the increase in RPMs, resulted in the load factor for the region increasing to 76.2 percent, 1.6 points higher than in 1999.

The recovery in traffic, coupled with a strong Japanese yen for most of the year, resulted in a turnaround in regional profitability for U.S. passenger carriers. Following operating losses of $180.6 million in 1999 and $369.8 million in 1998, U.S. passenger carriers recorded an operating profit of $198.1 million in 2000.

The recent open-skies agreements reached with Malaysia, New Zealand, Taiwan, Singapore, Brunei, and Korea, as well as new liberal bilateral agreements with Japan and China, will continue to stimulate aviation growth. Over the long-term, these agreements will provide travelers with service to more cities and lower fares.

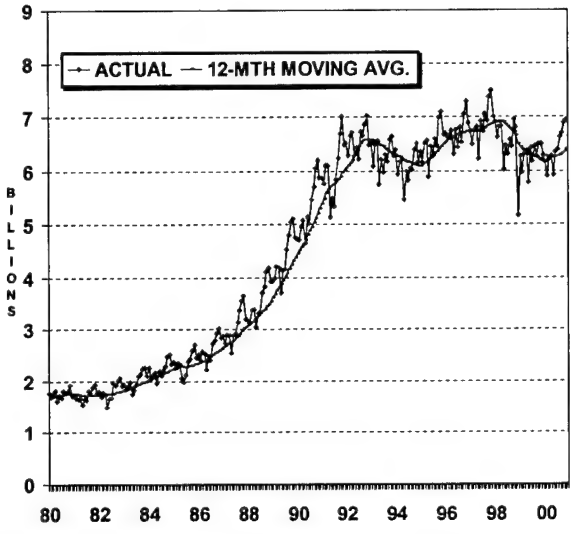






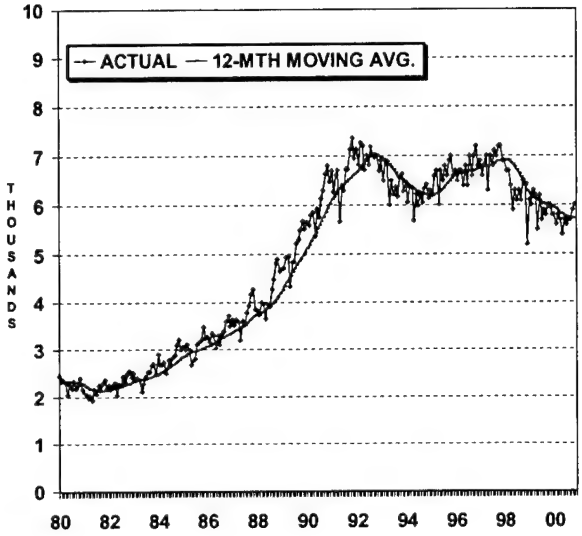
U.S. AIR CARRIER TRAFFIC TRENDS: PACIFIC ROUTES

AVAILABLE SEAT MILES



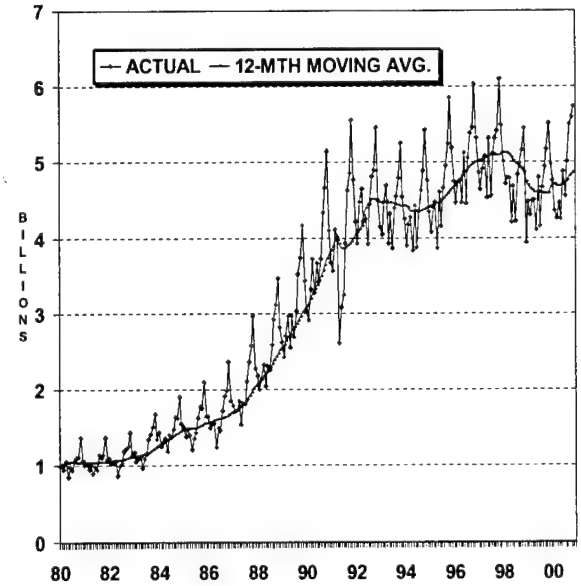
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



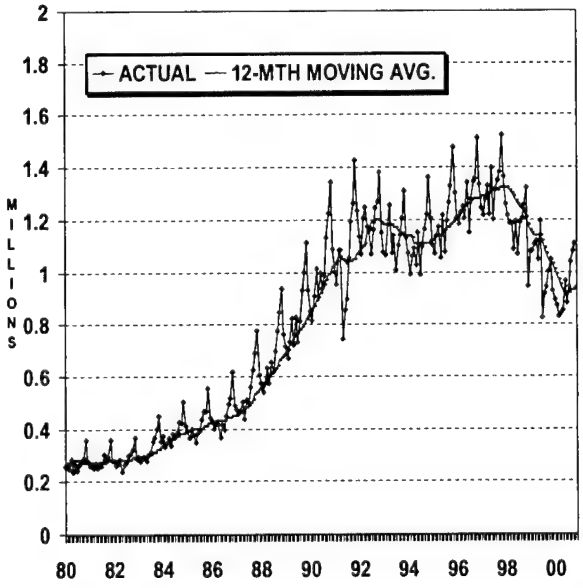
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

NONSCHEDULED TRAFFIC AND CAPACITY

The number of nonscheduled (charter) passengers flying on U.S. commercial air carriers fell 12.1 percent in 2000 to 9.7 million--5.2 million in domestic markets (down 22.3 percent) and 4.5 million in international markets (up 3.8 percent). Nonscheduled ASMs and RPMs declined 15.3 and 13.8 percent, respectively, in 2000, the result being a 1.2 point increase in load factor to 69.5 percent.

AIR CARGO TRAFFIC

Air cargo revenue ton miles (RTMs) flown by U.S. air carriers totaled 30.0 billion in 2000, up 6.7 percent from 1999. Domestic cargo RTMs (14.7 billion) were up 4.9 percent, while international RTMs (15.3 billion) increased 8.4 percent.

Freight/express RTMs (26.9 billion) increased 7.1 percent in 2000. This included 12.1 billion domestic RTMs (up 5.3 percent) and 14.8 billion international RTMs (up 8.6 percent). Mail RTMs (3.1 billion) increased 3.5 percent in 2000. This included 2.5 billion domestic RTMs (up 3.3 percent) and 531.9 million international RTMs (up 4.4 percent).

Air cargo RTMs flown by all-cargo carriers were 59.3 percent of total RTMs in 2000; passenger carriers flew the remainder, or 40.7 percent of the total. Total RTMs flown by all-cargo carriers increased 4.1 percent in 2000, from 17.1 billion to 17.8 billion. Total RTMs flown by passenger carriers were 12.2 billion in 2000 (up 10.8 percent).

GLOBAL INDUSTRY AND MARKET ASSUMPTIONS

The background against which the present forecasts for the next 12-year period (2001 to 2012) are developed are based upon a set of assumptions concerning changes in the economy, structural changes in the air carrier industry, and changes in the market for air transportation. Clearly, the probability of achieving the forecasts presented in this document is largely dependent upon the probability of realizing the economic projections discussed in Chapter II and industry assumptions discussed in the following section.

INDUSTRY STRUCTURE

Significant changes in the structure of the industry, both domestically and internationally, are intensifying competition, moving carriers to increase efficiency and productivity, reduce operating costs, and lower fares.

New, low-cost carriers are entering the domestic market, encouraged by the financial success of Southwest Airlines and large profit margins on many routes. Since CY 1989, 88 new entrant scheduled passenger carriers have applied for certification. Currently, 17 are still operating and four have been authorized but have not yet started operations.

Two carriers that began operations in 2000 are JetBlue Airways and Legend Airlines[3]. Some of the new carriers who are authorized but have yet to start operations include Cardinal Airlines and Puerto Rico Airlines. New entrants are needed to ensure that competitive forces remain strong in the industry. The benefits to the American

[3] Legend filed for Chapter 11 bankruptcy on December 3, 2000. It has since secured an additional $20M in financing and plans to restart service in January 2001.

consumer brought about by low-cost, low-fare airlines have been substantial. A recent report by DOT estimated that consumer savings, due to low-cost service, are now $6.3 billion annually.

Higher cost carriers are continuing to restructure to reduce their unit costs to the levels achieved by the more efficient airlines. The restructuring includes elimination of unprofitable routes or transfer of those routes to an aligned commuter carrier, seeking work rule changes, acquiring more efficient aircraft, and increasing employee productivity. In addition, with the recent spike in fuel prices, carriers have increased their hedging activity in order to minimize the impact of further oil price increases.

While higher cost carriers seek ways to reduce their unit costs, a resurgent airline labor movement is making the task more difficult. After a period of labor peace with givebacks and small increases in wages despite record profitability, labor has re-established itself as a force to be reckoned with in the industry. Beginning with the pilots strike at Northwest in 1998, the near strike by flight attendants at US Airways in late March 2000, and the just recently concluded pilots agreement at United Airlines, labor has shown that it will not tolerate its demands being subservient to the idea of cost competitiveness. There are currently contracts in negotiation at United (flight attendants, mechanics), Delta (pilots), American (pilots), Continental (pilots), and Northwest (mechanics). It remains to be seen if the United pilots contract serves as a catalyst for higher wage demands and/or renewed labor unrest following a period of labor peace. If so, the industry could see a reduction or reversal of the decline in unit costs that it has experienced during the past decade.

The airline industry could also be entering a new era of consolidation with United's proposed acquisition of US Airways, announced in late May. Immediately there was speculation that other major carriers would get together and, in fact, American and Northwest held merger discussions.[4] The ensuing months since the United announcement has seen a number of lawmakers and various consumer groups voice opposition to the merger, fearing that competition would be reduced. As of this writing no recommendation to allow or deny the merger has been issued by the Department of Justice.[5] If the merger is allowed to proceed, it is likely to significantly alter the structure of the industry and could have a far-reaching effect on the forecasts presented in this document.

The current system of bilateral agreements, which started back in the 1940s, severely restricts competition in international markets. History has amply demonstrated that competition improves efficiency, productivity, and worldwide economic growth. At the present time, DOT is attempting to create a more competitive international aviation environment for the U.S. airlines through the continuing expansion of open-skies agreements. DOT is also assessing the pros and cons of modifying cabotage constraints, modifying seventh freedom rights[6], and increasing foreign investment in U.S. air carriers from the current 25 percent.

During the last 8 years, the Administration has achieved 89 new and expanded bilateral agreements, 50 of which are open-skies. An analysis conducted by DOT showed that from 1996 to 1999, on routes connecting interior cities in both the United States and European countries, the average decline in fares was 20 percent where open-skies was in effect. In markets where there were no open-skies

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[4] American Airlines has announced its intentions to acquire Trans World Airways as well as a minority stake in DC Air. (Source: Aviation Daily, Tuesday, January 9, 2001)

[5] On December 22, 2000 the Department of Justice agreed to extend the period for regulatory review to April 2, 2001.

[6] Seventh freedom rights allow a carrier to pick up passengers from a country other than its own and deliver them in a third country, also not its own, on flights that do not connect to its homeland. (source: ALPA)

agreements, the average decline in fares was only 10.3 percent.

In 2000, new bilateral agreements were reached with Colombia and open-skies agreements were signed with four countries from Asia, one each from South America and Europe, and four countries from Africa. Included in the open-skies agreements was the first multilateral "Open-Skies" agreement. The agreement included Brunei, Chile, New Zealand, and Singapore and permits unrestricted international air service for all flights among the five countries for these countries' carriers.

Discussions concerning the liberalization of markets are also proceeding with other countries throughout the world. The expansion of these agreements over the next several years could significantly increase the level of activity of the more efficient U.S. carriers vis-à-vis foreign flag carriers.

The industry is expected to continue toward globalization, through the use of code-sharing agreements and alliances. Four large alliances have formed and are continuing to add members and network connections. The four are SkyTeam (Delta-Air France), Star Alliance (United-Lufthansa), Oneworld (American-British Airways), and Northwest-KLM. The alliances have been able to reduce costs through economies of scale. They have also increased revenues and passenger traffic by expanding the reach of the networks and providing seamless travel for their passengers.

To summarize, the industry is dynamic, with new entrants, but faces the possibility of a period of labor unrest and a number of mergers and international agreements that could fundamentally alter the industry structure. Although some of these changes could result in decreased demand in the short term, in the long run the net effect of these changes will be increased demand for air travel, increased air carrier efficiency, and reduced unit costs and fares.

MARKET CHANGES

There are a number of important trends occurring in the industry. Among these are: 1) the ability of air carriers to more closely adjust the number of discounted seats to maximize revenues and profits; 2) the growth of competition by low-cost carriers during most of the 1990s; 3) increased numbers of open-skies agreements; 4) increased efficiency and productivity; 5) expanding global alliances; and 6) declining real fares. Offsetting some of the positive benefits of the above is the increased willingness of labor to use its strike power to counter large carriers attempts to reduce unit costs. On the demand side, we see increasing sensitivity of business travelers to the cost of air trips, a shift in consumer preference for pleasure travel by air, and a long-term expansion of the economy.

Business demand for air travel will become more price elastic for two reasons. First is the increase in the availability of substitutes. Not only is innovative new technology, such as videoconferencing, expanding rapidly but also the development of more productive and efficient corporate aircraft has given business travelers more choices than previously. Second, as the relative price of business travel increases vis a vis discounted travel, business travelers will become more tolerant of the conditions of discounted travel (advance purchase, Saturday night stays, etc) in order to qualify for the discounts.

The demand for leisure travel during the 1990s has also experienced major shifts because of increasing consumer preference for air travel, increasing disposable income, expanding personal wealth, and lower relative fares. The 1998 Air Travel Survey conducted by the Air Transport Association of America shows that the percent of individuals who have ever flown increased from 74 percent in 1990 to 81 percent in 1997.

It is an inescapable conclusion that increasing productivity, growth in capacity, and competitive markets must be achieved to keep relative fares declining. These market conditions will assure growth in demand and provide the industry with acceptable rates of return on capital.

GLOBAL RISKS AND UNCERTAINTIES

The forecasts of scheduled commercial air carrier demand are based on a specific set of assumptions concerning economic growth in the United States and abroad, the political environment in which they will take place, Government tax policy, and changes in industry structure. There are many uncertainties in all these areas that could alter the short-and long-term environment, and cause the outcomes to be different from those forecast. Developments that could alter the forecasts include:

- the strength and duration of the current United States economic expansion and economic growth in the rest of the world;
- the impact of regional jets;
- the number of business cycles that occur over the forecast period;
- the movement of future oil prices;
- structural changes in the international markets that affect U.S. carrier shares;
- the degree of competition in both the domestic and international markets;
- how far carriers can reduce unit costs, especially in light of a resurgent labor movement;
- how fast yields decline due to increased competition and cost reductions;
- when and if the industry reaches equilibrium;
- the impact of industry consolidation; and
- the impact of continued air traffic delays.

In addition, the network of bilateral pacts that the United States currently has in place in Europe, the Far East, and South America could significantly inhibit the expansion plans of air carriers operating in these international regions and restrain traffic growth. On the other hand, the move towards deregulation, privatization of national carriers, and expansion of open-skies agreements could result in significantly greater traffic growth.

DOMESTIC PASSENGERS: ASSUMPTIONS AND FORECASTS

During the past several years the FAA has adopted a decision-theoretic forecasting system. The approach is generally accomplished in two stages. Initially, projections are made with the use of econometric and time series models. The model equations and outcomes are then adjusted based upon "expert industry opinion" to arrive at posterior forecasts for use in the decision-making process.

It is believed that optimum policy forecasts can only be achieved by combining model forecasts and judgment. Since models are relatively simple descriptions of very complex systems, they cannot account for all the political, social, psychological, and economic factors and their interactions that will lead to a particular set of outcomes. Therefore, it is essential to use

judgment to account for the complexities of the operating environment. This can be accomplished by adjusting the exogenous variables, adjusting the model outputs, or revising the models initial parameter estimates.

A forecasting system should be frequently reviewed and revised with the objective of reducing forecast errors. The decision-theoretic approach has produced excellent results for the FAA. Forecast errors are declining. In addition, the forecasts errors tend to be normally distributed about a zero mean, showing that the forecasts are not consistently high or low. Over a long planning horizon, this forecasting structure will significantly increase the efficiency of the investment process.

Some of the important outside sources for adjusting FAA's projections are forecasts developed by: 1) the International Civil Aviation Organization's (ICAO) Asia/Pacific Area Traffic Forecasting Group (May 2000); 2) ICAO's North Atlantic Traffic Forecasting Group (May 2000); and 3) the National Academy of Sciences' Transportation Research Board Future Aviation Activities International Workshop (September 1999).

MODELING DOMESTIC RPMS AND ENPLANEMENTS

The model used for developing FAA domestic commercial air carrier forecasts relies upon a system of statistical and deterministic equations. The pivotal equations of the system relate RPMs and enplanements to two primary independent variables--GDP and yield--both adjusted for inflation. This analytical framework for forecasting enplanements ties the domestic forecast model closer to projected changes in economic activity and reduces the number of subjective inputs. This approach is expected to reduce the standard errors of the forecasts.

During the pre-deregulation era, prices were set by the now defunct Civil Aeronautics Board, and generally did not respond to shifts in demand and supply. Therefore, single-equation least squares methods were adequate for forecasting domestic demand. Market forces quickly took hold following deregulation in 1978. To adjust for the jointly dependent variables in the demand and supply equations, two-stage least squares is used to estimate the demand equations. The primary exogenous variable specified to estimate the independent variable, real yield, is real operating costs per ASM. A dummy variable is included in the model to distinguish between the pre- and post-deregulation periods.

Personal income per capita and median family income were also tested in the aggregate demand equations to determine if we could reduce the standard errors and adjust for collinearity problems. The results using either variable were consistent with the use of GDP as the measure of economic activity. Further, the forecasts of aviation activity using the two different formulations were not significantly different from those constructed using only GDP and yield.

Although it is aggregate demand that we forecast, it would be preferable to use different models to estimate the two distinct components of each market--business and personal travel. A further refinement would distinguish the long-haul from the short-haul market. This approach would provide important information for developing public policy and would most likely improve the accuracy of the forecasts. Clearly, these markets are affected by different sets of variables, and adjust at different rates to them.

For example, most experts in the industry would agree that the price elasticity of demand for business travel differs from the price elasticity of demand for pleasure travel. Furthermore, theory would suggest that business profits are a factor in determining business travel, and that

some measure of personal or family income is an important variable affecting pleasure travel.

At this time, however, the lack of an adequate data base subdivided into these four components precludes the development of forecasts for each market at the national level. Additional research and data collection are necessary to advance this approach.

U.S. AIR CARRIERS' YIELDS AND OPERATIONAL VARIABLES

In developing the demand forecasts it was assumed that over the long-run: 1) industry improvements in efficiency and productivity continue at historical rates; 2) competitive forces remain strong; and 3) capacity is continuously adjusted so that demand and supply are in equilibrium.

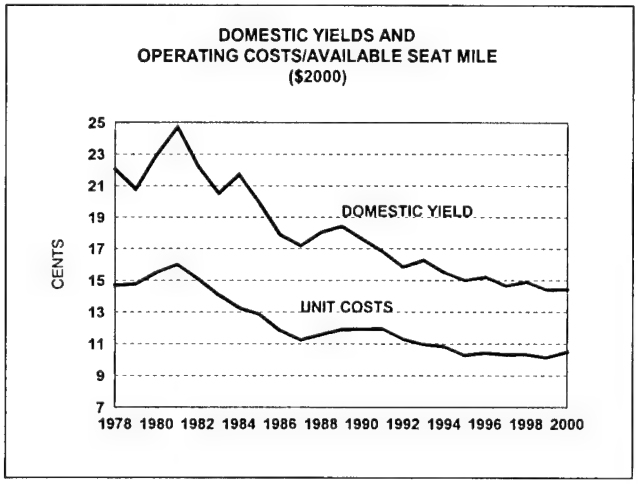
Passenger Yields

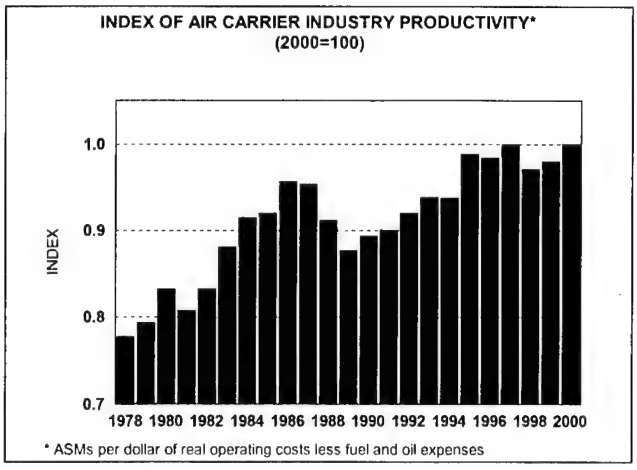
During the period 1970 through 1977 domestic real yields declined at a rate of 1.3 percent a year. Since deregulation, the decline in real yields has accelerated, so that by 2000 real yield fell to 14.42 cents, an average yearly decline of 1.9 percent--1.5 times higher than the rate achieved during the 1970s.

In the 1970s the dominant reason for the decrease was the introduction of large numbers of more efficient jet aircraft into the fleets operated by air carriers. In the 1980s the airlines started to adjust to a deregulated industry by rationalizing their route structures, and increasing labor productivity.

Financial weakness of the industry in the early 1990s along with excess capacity, the growth of new-entrant, low-cost carriers, and the expansion of Southwest into new markets has brought about intense fare competition. Competition has pushed high-cost carriers into restructuring, increasing productivity, and lowering unit costs.

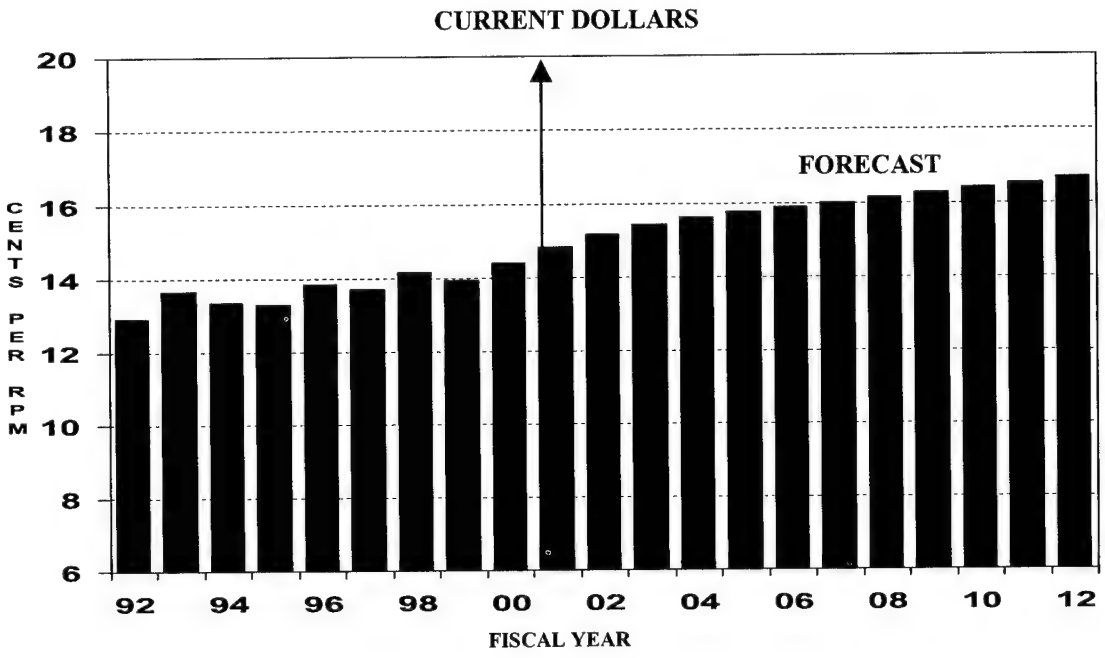
Since deregulation, unit costs (real operating costs adjusted for ASMs) have been declining along with yields. In fact, our analysis has shown that there is a high positive correlation between domestic real yields and unit costs, and that a 1.0 percent decline in unit costs will, on average, reduce real yields by about 0.9 percent. Also, productivity in the industry, as measured by ASMs per dollar of real operating costs less fuel and oil expenses, has increased by approximately 1.2 percent a year since 1978.

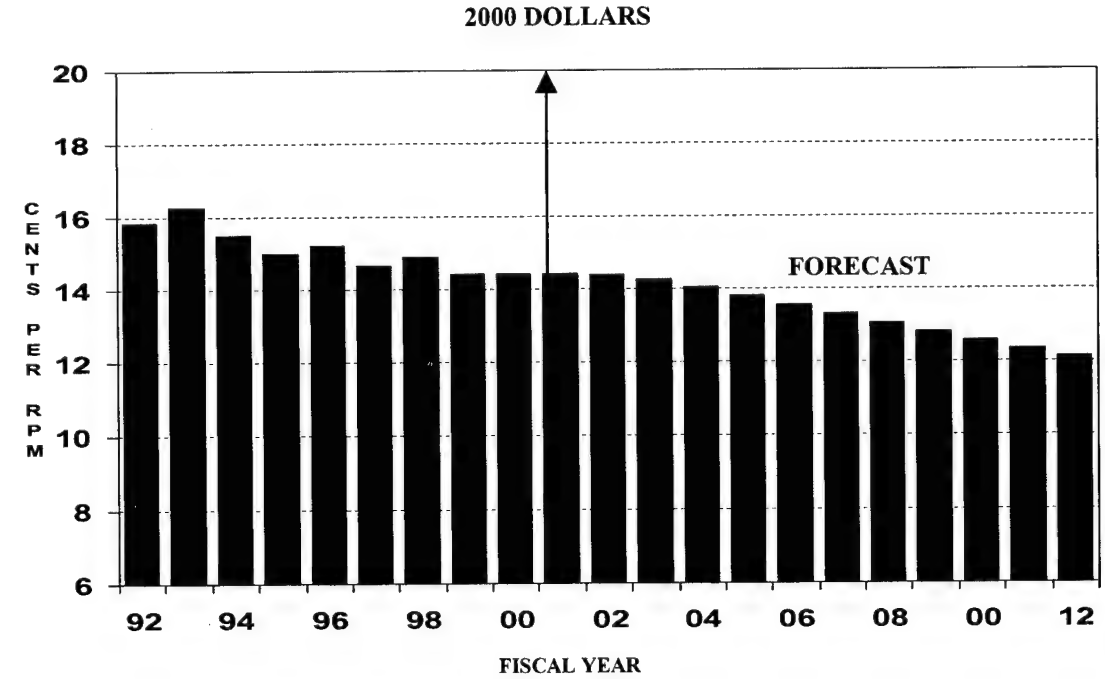


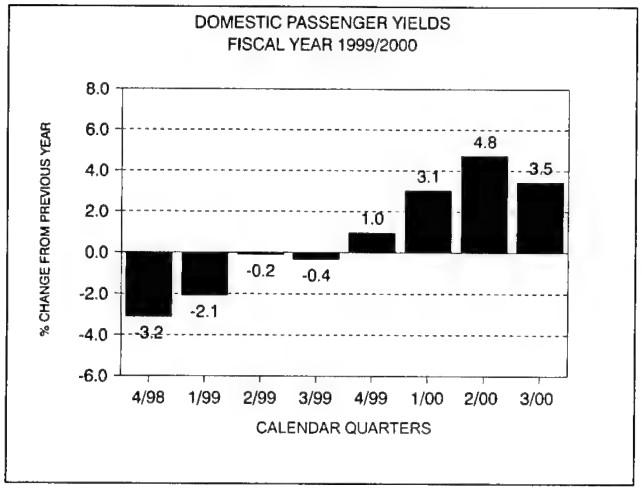


In 1999 nominal yields declined every quarter, real yields were down 3.3 percent for the year, and capacity increased 5.2 percent, the largest increase since 1990. Nominal yields were up in

U.S. COMMERCIAL AIR CARRIERS: DOMESTIC PASSENGER YIELDS





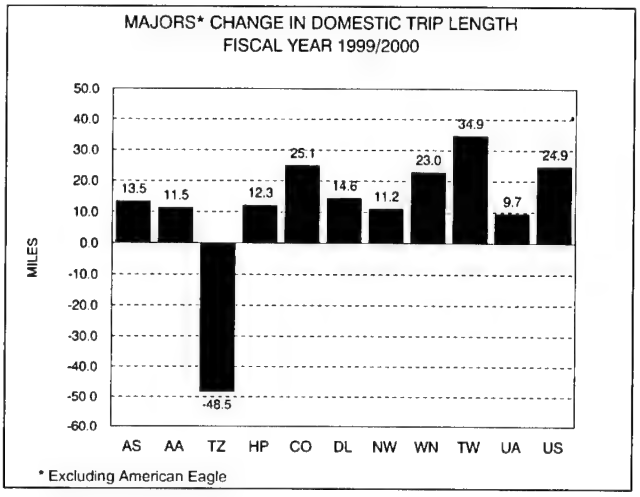


every quarter in 2000, driven in part by fuel related fare increases. However, real yields increased only 0.1 percent for the year. Capacity growth was 4.6 percent but would have been higher were it not for operational difficulties at United during the summer.

Nominal yields are forecast to go up 2.9 percent in 2001, 2.4 percent in 2002, and 1.7 percent in 2003. Real yields decrease at an average annual rate of 0.3 percent during the same period. The relatively large increases experienced in the short-term are for the most part due to the rising unit costs driven by relatively high fuel prices and rising labor costs. In 2002 and 2003, oil prices are forecast to decline 25 percent then grow slower than general inflation for the balance of the forecast, resulting in unit costs returning to their long run decline. It is also assumed that the air carriers will optimally adjust their capacity to meet future demand. For the period 2005 through 2012, continued competition and expanding capacity results in nominal yields increasing 0.8 percent a year, while real yields fall 1.9 percent. Over the 12-year forecast period, nominal yields increase from 14.42 cents in 2000 to 16.68 cents in 2012, while real yields decline 1.4 percent a year.

Passenger Trip Length

In 2000 the average domestic passenger trip length increased 11.1 miles. This was due largely to the continued turning over of short-haul routes to code-sharing regional partners and the expansion of Southwest, Continental, TWA, and US Airways into longer-haul markets.



The rapid integration of new state-of-the-art aircraft into the regional/commuter fleet--especially regional jets and large, high-speed turboprops with ranges of up to 1,000 miles--could significantly alter the route system of the industry. These new aircraft are enabling regional/commuters to greatly expand the number of markets they serve.

The continued turnover of short-haul markets by the majors to their code-sharing regional partners, expansion of low-cost carriers into longer-haul markets, restructuring of the regional/commuter fleets, and expansion of point-to-point service are expected to increase the domestic trip length modestly during the forecast period. For the entire forecast period, the average trip length increases 4.6 miles per year, increasing from 832.3 miles in 2000 to 887.3 miles in 2012.

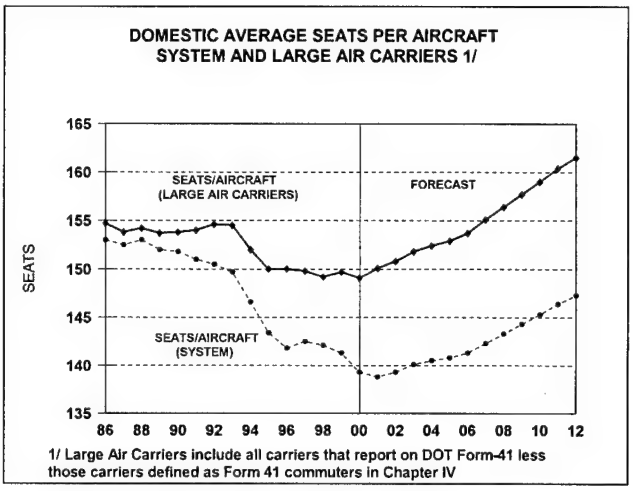
Average Aircraft Size

Between 1978 and 1983, the average seating capacity of aircraft used by U.S. commercial air carriers in domestic markets increased by over 17 seats (136.4 seats to 153.6 seats). Between 1983 and 1993, however, the average number of seats remained relatively stable at 152.1, with a standard deviation of only 1.3 seats. From 1993 through 2000, the average number of seats fell precipitously from 149.7 to 139.3 seats--the largest decline during the past 20 years.

The large increase in domestic short-haul traffic by the low-cost, low-fare carriers (Southwest, AirTran, etc.) had been only partly responsible for this occurrence. The most probable cause of the big decline in the average number of seats was the increased number and activity of regionals/commuters reporting on DOT Form 41.[7]

To test this premise, the number of seats for the domestic fleet was calculated for the period 1986 through 1999 without the regional carriers reporting on Form 41. These carriers generally operate in short-haul markets with turboprop or the new regional jet aircraft. Their average seating capacity for the 1986-1999 period was 35.5 seats. For the period, excluding the regional carriers, average yearly seating capacity for the large air carriers was 4.3 seats higher and almost static since 1995.

In 2000 the average number of seats for all domestic Form 41 carriers declined 2.0 seats. The average number of seats for the large air carriers decreased by 0.6 seats, while the average number of seats for regional carriers reporting on DOT Form 41 increased 2.2 seats.



Current fleet plans by both the large air carriers and regionals/commuters show that the average seat size is increasing. Most new aircraft entering the fleet--either for replacement or expansion of capacity--will be larger. The result will be an increase in the average seat size throughout the forecast period.

The seating capacity for domestic large air carriers is forecast to increase, on average, one seat per year, while the regionals reporting on DOT Form 41 are forecast to increase 0.6 seats per year. For all DOT Form 41 domestic carriers, average seating capacity increases 0.7 seats per year.

Passenger Load Factor

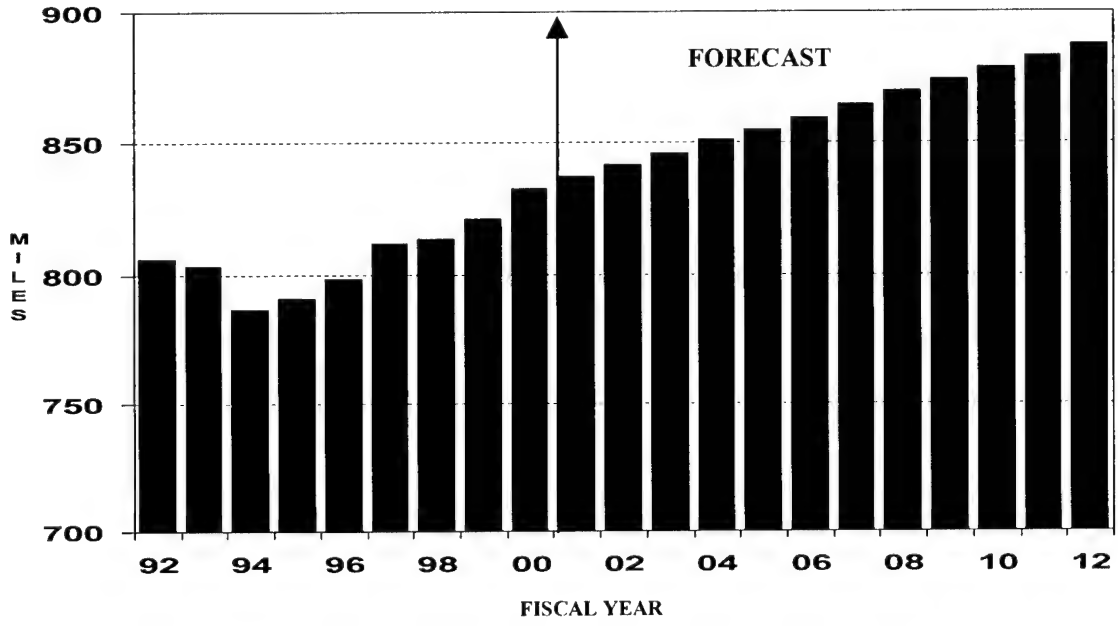
Domestic load factors were relatively stable over the period 1978 through 1993, ranging from a low of 57.7 percent to 63.0 percent. From 1993 through 2000, the load factor increased 9.6 percentage points, expanding from 61.3 percent to 70.9 percent. During this period, the carriers developed the capability to rapidly adjust capacity to changing conditions in both the domestic and international markets to meet demand while pushing up load factors.

Despite capacity increases of almost 10 percent over the past 2 years, traffic growth in excess of 11 percent has resulted in the load factor

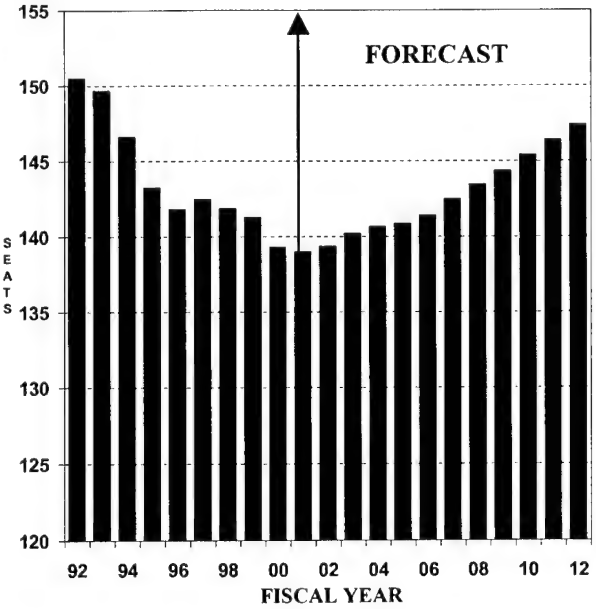
[7] If a carrier operates one aircraft with 60 or more seats, even though most of their aircraft are under 60 seats, they are required to report all traffic statistics on DOT Form 41.

U.S. COMMERCIAL AIR CARRIERS: DOMESTIC OPERATIONAL VARIABLES

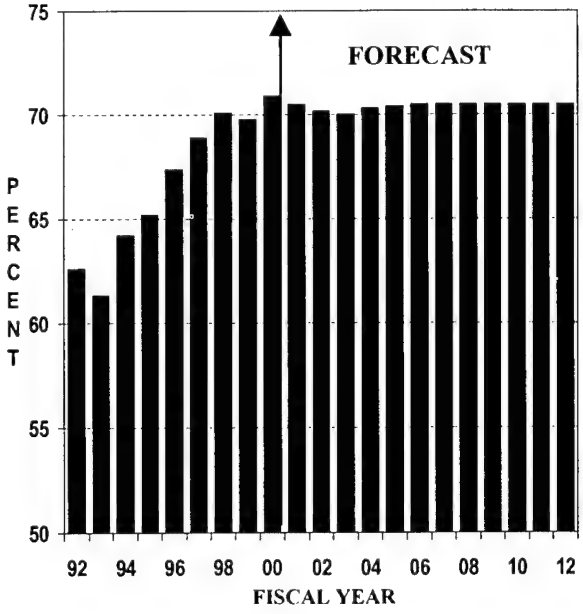
PASSENGER TRIP LENGTH



SEATS PER AIRCRAFT



LOAD FACTOR



increasing to 70.9 percent--the highest average yearly level ever achieved on domestic routes.

Relatively large increases in capacity as new aircraft enter the fleet, along with the impact of slowing of U.S. economic growth and higher fares, will put downward pressure on load factors through 2003. ASMs are forecast to increase 4.6 percent in 2001, 4.0 percent in 2002 and 4.4 percent in 2003. Load factor is forecast to decline to 70.5 percent in 2001, 70.3 percent in 2002, and 70.0 percent in 2003. As carriers adjust capacity by 2004, the load factor begins to increase, reaching 70.5 percent in 2006. For the remainder of the forecast period it is assumed that ASMs will be adjusted at the same rate in response to changes in demand so that demand and supply will be in equilibrium. For the period 2007 through 2012, capacity and RPMs are expected to grow 4.2 percent a year, resulting in an average load factor of 70.5 percent.

FORECASTS

Revenue Passenger Miles

Since the most recent economic expansion began in 1991, domestic RPMs have been continuously increasing, averaging 4.7 percent growth per year over the 9-year period. Scheduled domestic RPMs totaled 502.8 billion in 2000, up 6.3 percent compared to 4.8 percent in 1999. The strong traffic growth in 2000 was driven by strong growth in the U.S. economy, lower real fares, and heightened consumer confidence.

The expected slowing of the U.S. economy in 2001 through 2004 will slow the growth of traffic. Domestic traffic increases 3.9 percent in 2001, 3.6 percent in 2002, and 4.0 percent in 2003. As the economy returns to its long-term growth rate in 2004, traffic increases, on average, 4.3 percent a year for the remainder of the forecast period. The average annual increase in domestic RPMs over the 12-year planning horizon is forecast to be 4.2 percent, with domestic RPMs reaching 822.1 billion in 2012.

Passenger Enplanements

U.S. scheduled domestic air carriers enplaned a total of 604.1 million passengers in 2000, up 4.9 percent compared to 3.8 percent increase in 1999. Domestic passenger enplanements are forecast to increase 3.3 percent in 2001, 3.0 percent in 2002, and 3.5 percent in 2003. For the remainder of the forecast period, enplanements increase 3.7 percent a year. The growth in enplanements is projected to average 3.6 percent annually during the 12-year forecast period, with the number of domestic enplanements reaching 926.6 million in 2012.

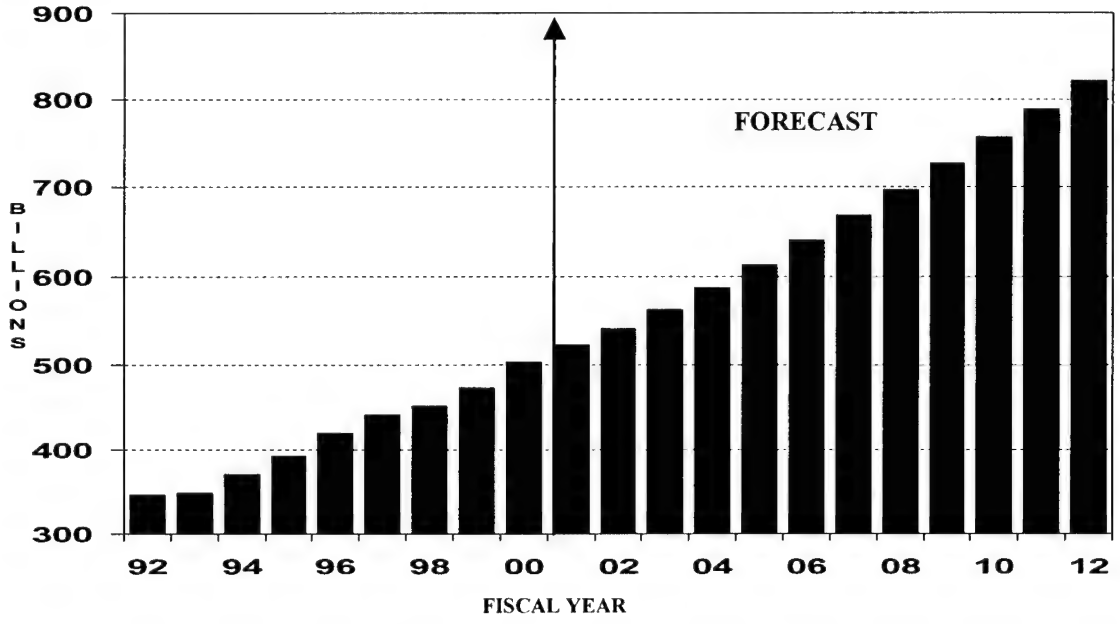
INTERNATIONAL PASSENGERS: ASSUMPTIONS AND FORECASTS

MODELING INTERNATIONAL RPMS AND ENPLANEMENTS

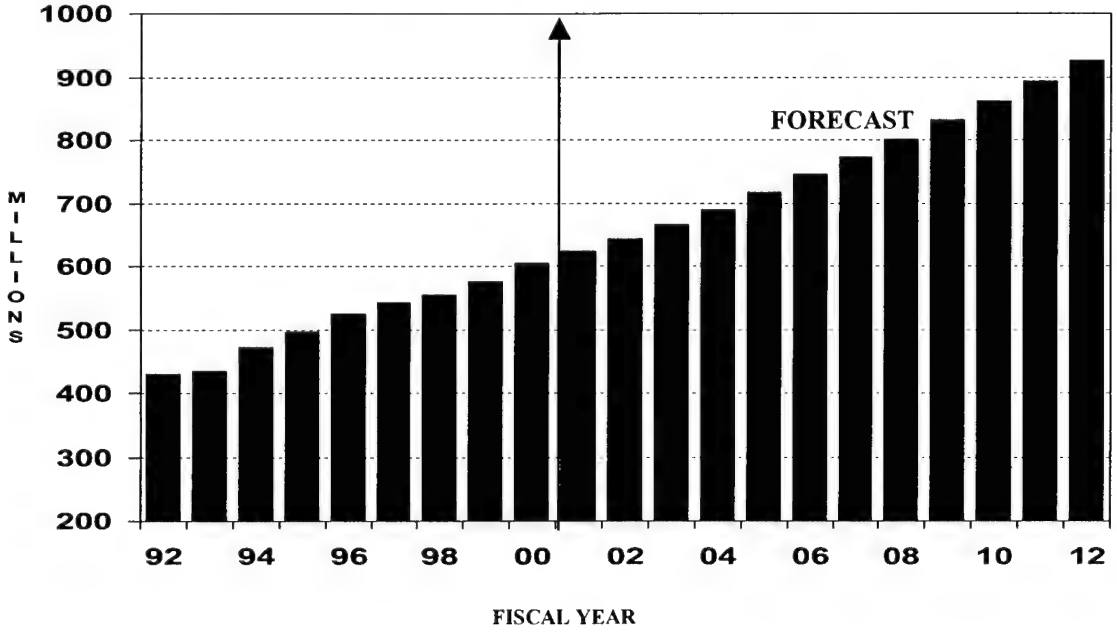
A new system of statistical and deterministic equations was developed in 1997 for forecasting U.S. flag carriers' international RPMs and enplanements for the three world regions--Atlantic, Pacific, and Latin America. Initially, total passengers (U.S. and foreign flag carriers) are estimated in each world region based on the region's GDP and U.S. GDP. Secondly, projections of U.S. and regional GDP, along with assumptions concerning U.S. market share

U.S. COMMERCIAL AIR CARRIERS: DOMESTIC FORECASTS

SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



in each region, are used to forecast U.S. flag carriers' international enplanements. The forecasts of enplanements and assumptions concerning average trip length are then used to derive U.S. flag carriers' international RPM projections. This approach ties U.S. flag carrier activity in the international regions to total demand and should, over the long-term, increase the accuracy of the workload and trust fund revenue projections.

Although economic theory suggests that fares, exchange rates, and relative country consumer prices should be important arguments in an international demand equation, the analyses clearly demonstrate that aggregate economic activity explains a large percentage of the variability in demand and is sufficient to develop accurate macro international forecasts. However, these aggregate results may differ significantly from micro analyses of individual markets categorized by distance, type of flying, and level of competition.

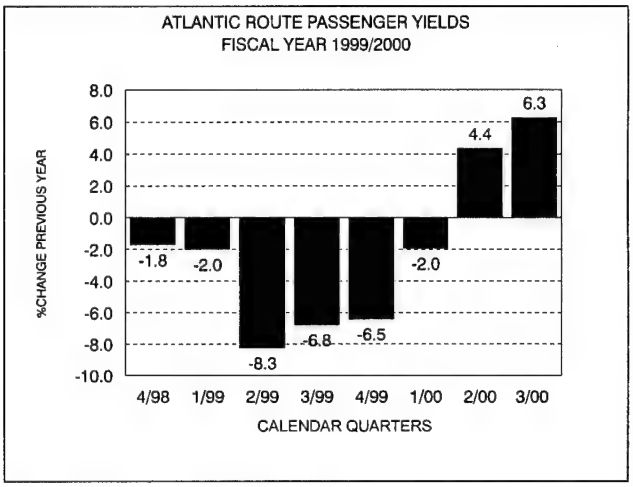
ATLANTIC MARKET

U.S. Air Carriers' Yields and Operational Variables

Passenger Yields

In 2000 current dollar yield (9.72 cents) increased 1.1 percent, while real yields in the market fell 1.9 percent. This followed a drop in real yield in 1999 of 6.9 percent. Yields fell in the first half of 2000 then increased in the latter half of the year. The decline in yields in 2000 can be attributed to the significant increase in capacity (ASMs up 7.1 percent) and competition in the market.

Real yields in the Atlantic market are expected to continue to fall at the relatively high rate of 2.2 percent through 2003 due to the continued rapid increase in capacity. For the balance of the forecast period, real yields are projected to decline 0.6 percent a year, while nominal yields are expected to increase at an annual rate of 2.1 percent. For the period 2000 through 2012, nominal yields increase from 9.71 to 11.85 cents.

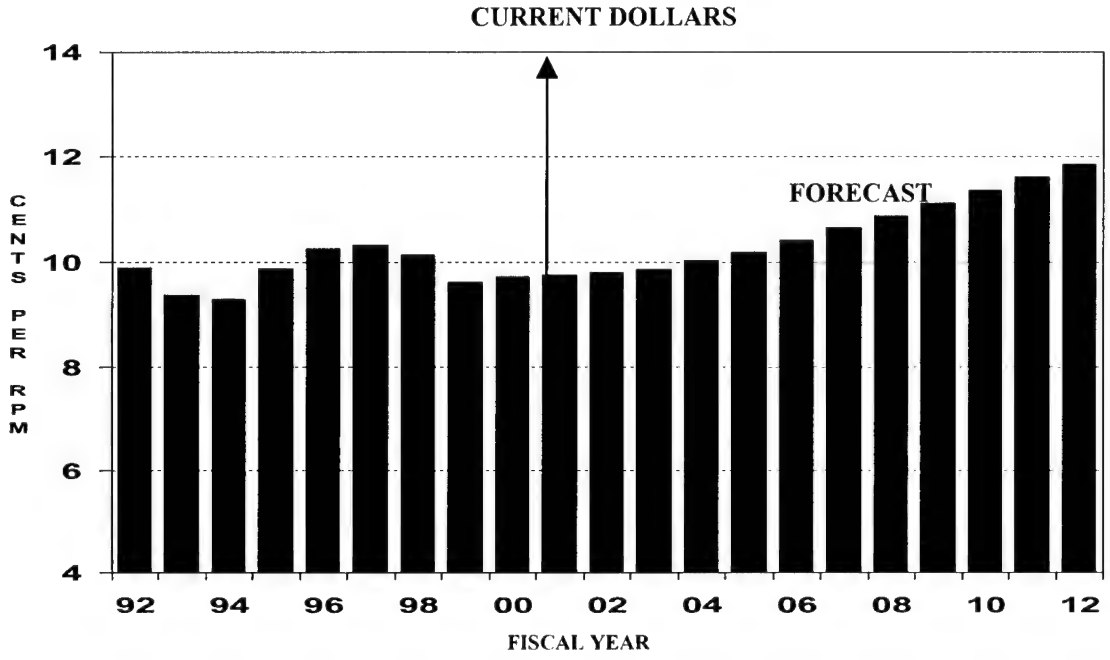


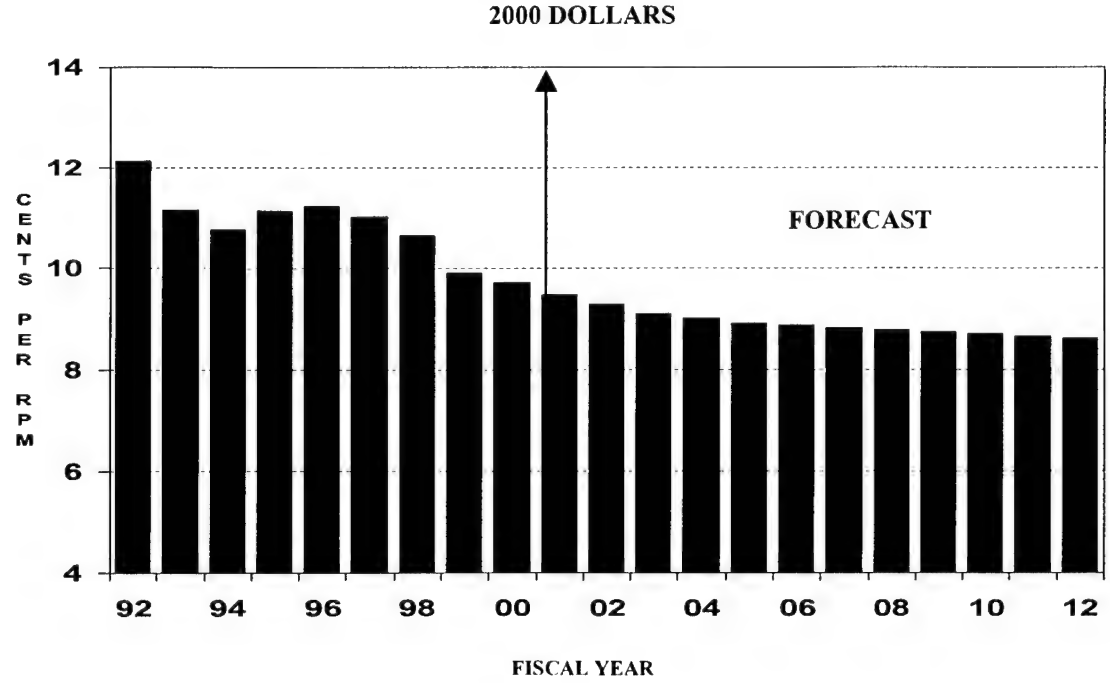
Passenger Trip Length

In 2000 the average passenger trip length in the Atlantic market increased 6.4 miles, down from the 26.5 miles increase in 1999. The small increase in trip length was primarily due to a shift in the carrier mix from relatively longer haul carriers (United, TWA, and American) to shorter haul carriers (Continental and US Airways). Since 1990, average trip length has increased from 3,341.4 miles to 4,168.3 miles--up 826.9 miles. The increase in average passenger trip length over the period was primarily due to more direct flights and expanded service into Central and Eastern Europe. This trend is expected to continue over the 12-year forecast period.

The average trip length is forecast to increase 19.5 miles in both 2001 and 2002. For the remainder of the planning period--2003 through 2012 — trip length increases average 11.5 miles annually. For the period 2000 through 2012, the

U.S. COMMERCIAL AIR CARRIERS: ATLANTIC PASSENGER YIELDS





Atlantic market trip length increases from 4,168.3 miles to 4,322.3 miles--up 154 miles.

Average Aircraft Size

The average aircraft size in the Atlantic market continuously increased during the 1970s and early 1980s as the widebody DC-10s/L-1011s and B-747s dominated the market, peaking at 332.0 seats in 1985. Since the mid 1980s, the advent of the B-767 and other aircraft flying extended-range twin-engine operations (ETOPS), has resulted in the average seat size steadily declining. In 2000 the average aircraft size was 233.7 seats--a decline of 98.3 seats from 1985.

Over the 12-year forecast period, the average aircraft size in the Atlantic market gradually increases as the major carriers expand the number of non-stop city-pair services and use of larger two-engine widebody aircraft. Average aircraft size increases to 250.7 seats by 2012--an increase of approximately 1.4 seats per year.

Passenger Load Factor

With the exception of 1986[8], Atlantic market load factors were relatively stable over the period 1980 through 1989, ranging from a low of 63.8 to 65.7 percent. From 1989 through 2000, the load factor increased 13.5 percentage points, from 65.7 percent to 79.2 percent.

Although capacity expanded 7.1 percent in 2000, RPM growth of 9.5 percent increased the load factor to 79.2 percent--the highest average yearly level ever achieved in the Atlantic market.

Relatively smaller increases in capacity are expected through 2004 as U.S. carriers move capacity back into an expanding Asia/Pacific market. ASMs are forecast to increase 7.3 percent in 2001, then 6.1 percent in 2002, and 6.6 percent in 2003. RPMs will grow slightly less than capacity in 2001 resulting in a load factor decline to 78.8 percent. Load factor then increases steadily up to 80 percent by 2005 as traffic increases, driven by economic growth and falling real yields, outpace capacity increases. For the balance of the forecast period, load factor remains at 80 percent as the market achieves equilibrium.

Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on Immigration and Naturalization Service (INS) data, which is compiled by the Department of Commerce, total passengers in the Atlantic market grew 4.4 percent in CY 1999 (the latest full year for which data is available). Preliminary data shows total passengers increasing about 8.2 percent in 2000.

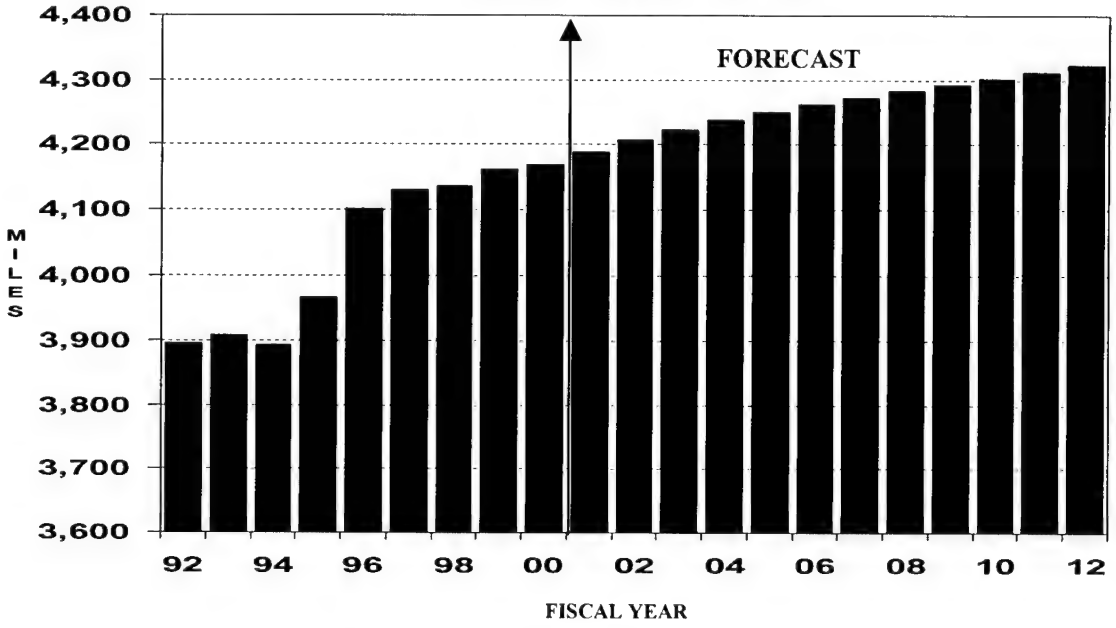
U.S. air carrier's market share for the Atlantic region has been steadily declining since 1988, when it peaked at 48.5 percent. In 1999 U.S. market share declined to 38.5 percent. However, preliminary data indicate that U.S. carrier market share increased to 39.0 percent in 2000. Additionally, the percent of total passengers that are U.S. citizens traveling in the Atlantic market has been falling. From a peak of 67.7 percent in 1985, the ratio has fallen to 51.0 percent in 1999.

Using the latest forecasts of GDP for the U.S. and Atlantic regions, total passengers traveling in the Atlantic market are expected to increase 5.1 percent in CY 2001 and 5.6 percent in 2002.

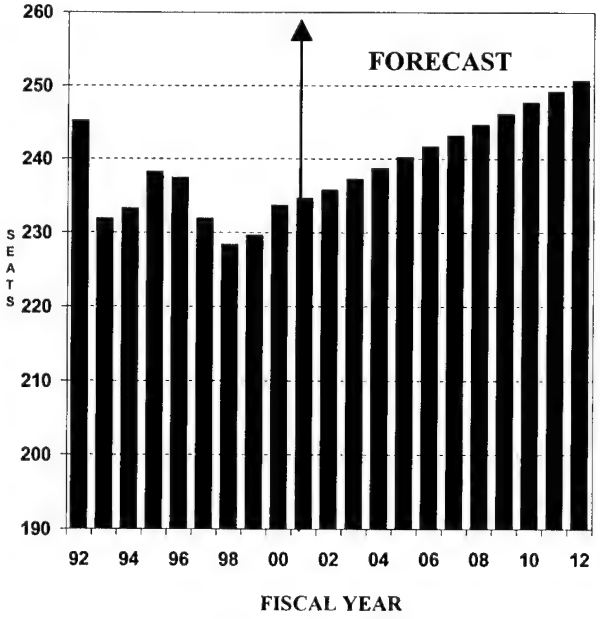
[8] The load factor in 1986 was 56.0 percent, the result of increased terrorism on these routes

U.S. COMMERCIAL AIR CARRIERS: ATLANTIC OPERATIONAL VARIALBES

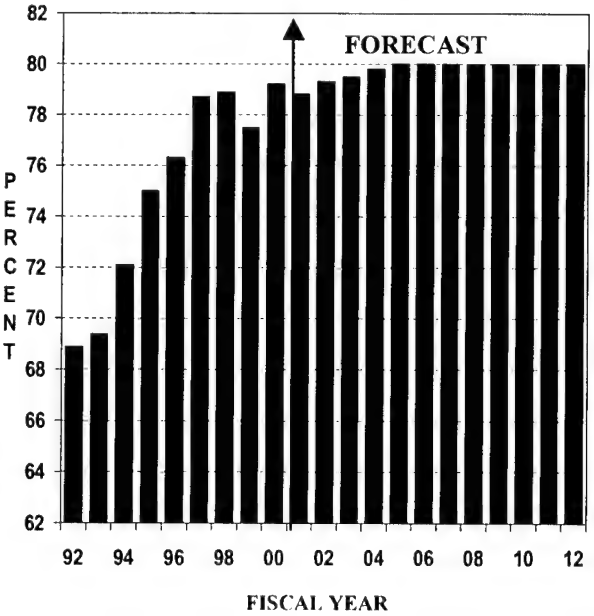
PASSENGER TRIP LENGTH



SEATS PER AIRCRAFT



LOAD FACTOR



Over the entire forecast period, total passengers increase an average of 4.9 percent per year, from 52.7 million in 2000 to 93.2 million in 2012.

The International Civil Aviation Organization (ICAO) North Atlantic Traffic Forecasting Group (Canada, U.S., U.K., and Portugal) was formed with the primary objective of developing forecasts of air traffic over the North Atlantic and between North American and the Caribbean. Annual forecasts are provided for both total passengers and aircraft movements to support air navigation systems planning activity for ICAO and its member states.

The Group develops baseline, optimistic, and pessimistic forecasts based upon changing assumptions of available capacity, yields and economic growth. The Group's baseline forecast shows passengers increasing 7.0 percent a year for the period 1999 through 2005. For the optimistic scenario, passengers increase 7.8 percent per year, while the pessimistic scenario shows an annual growth rate of 5.5 percent. Aircraft movements for the baseline scenario expand 5.6 percent a year. The optimistic and pessimistic scenarios show growth rates of 7.2 and 4.0 percent, respectively.

Copies of the report entitled, "*North Atlantic Air Traffic Forecasts for the Years 2000-2005, 2010 and 2015,*" can be obtained from the FAA's Statistics and Forecast Branch, Office of Aviation Policy and Plans, phone (202) 267-3355.

U.S. Flag Carriers' Passenger Enplanements

U.S. scheduled air carriers in the Atlantic market enplaned a total of 20.9 million passengers in 2000, up 9.3 percent. Atlantic market passenger enplanements are forecast to increase 6.1 percent in 2001 and increase on average 5.2 percent annually during the 12-year forecast period. The number of Atlantic market enplanements reaches 38.4 million in 2012—83.7 percent higher than in 2000.

U.S. Flag Carriers' Revenue Passenger Miles

Since 1991, Atlantic market RPMs have been continuously increasing due to strong, steady economic growth in the U.S. and Europe and declining real yields. For the period 1991 thorugh 2000, RPMs increased 7.1 percent a year. Atlantic market RPMs totaled 87.1 billion in 2000, up 9.5 percent from 1999. In 2001, Atlantic market RPMs are forecast to increase 6.6 percent. The average annual increase in RPMs over the 12-year forecast horizon is 5.5 percent, reaching 165.9 billion in 2012.

LATIN AMERICAN MARKET

U.S. Air Carriers' Yields and Operational Variables

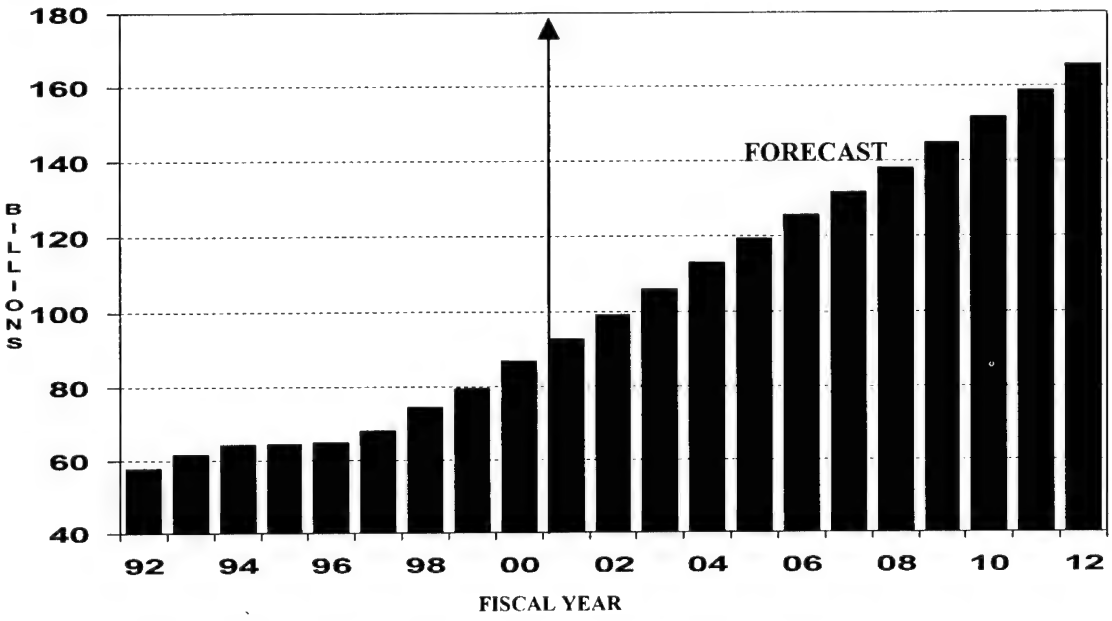
Passenger Yields

In 2000 Latin American yield (13.21 cents) increased 3.5 percent and real yield increased 0.4 percent. In 1999 nominal and real yield declined 7.0 and 8.7 percent, respectively. Since 1994, real yield in the market has declined 19.1 percent.

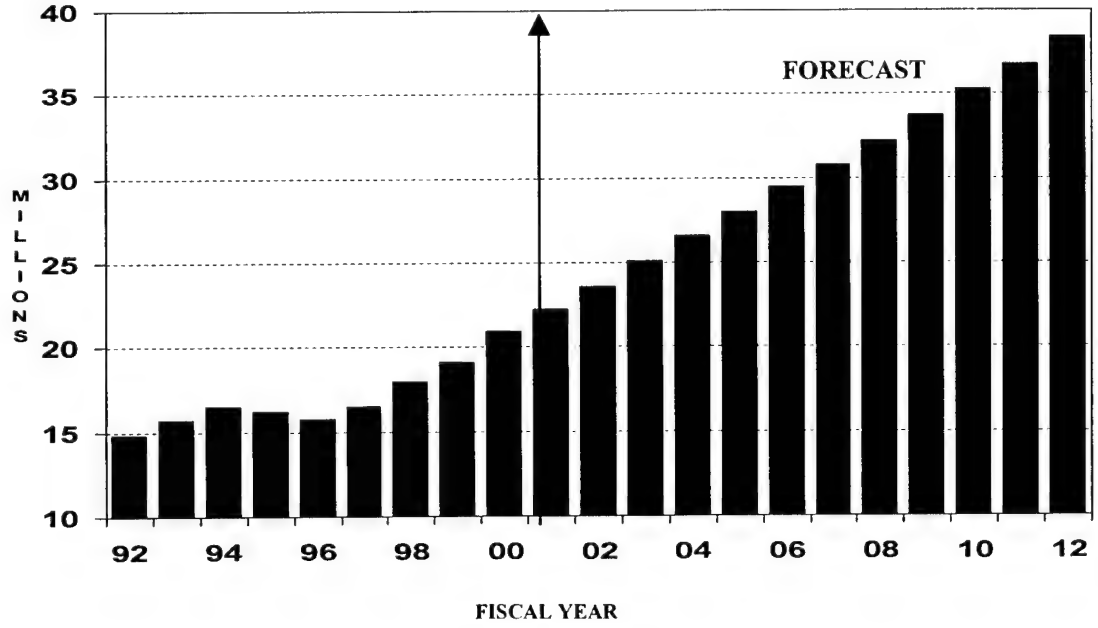
In 2000, regional capacity increased 0.5 percent, following increases of 1.6 percent in 1999 and 13.6 percent in 1998. Since 1994 capacity in the market is up 43.7 percent. Capacity growth is expected to be rapid in the next few years (up 9.3 percent annually) as U.S. carriers continue to expand service into both the Caribbean and South America. The softening of the U.S.

U.S. COMMERCIAL AIR CARRIERS: ATLANTIC FORECASTS

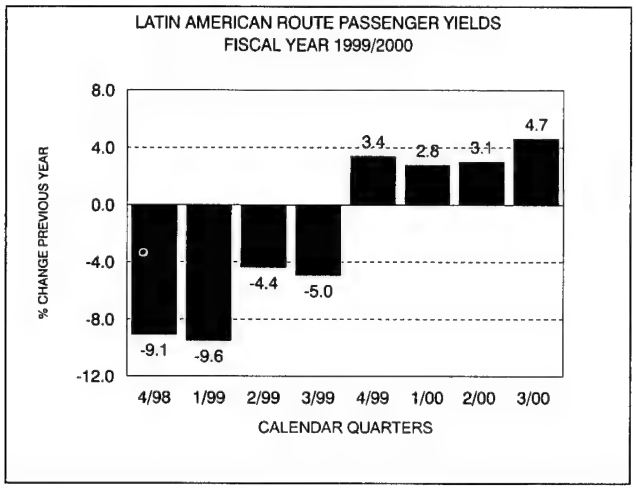
SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



economy over the next several years, intense competition, and increased productivity should continue to push real yields down in both the short- and long-term.



Real yields are expected to decline 2.0 percent a year through 2003, and continue to fall throughout the remainder of the forecast period but at a slower rate of 0.5 percent a year. Over the forecast period, real yields are declining at a rate of 0.9 percent a year, while nominal yields increase at an annual rate of 1.8 percent, reaching 16.35 cents in 2012.

Passenger Trip Length

The continued expansion of U.S. carriers into South America--Argentina, Brazil and Chile--and the expansion of routes from the Northeast to the Caribbean resulted in the average trip length increasing 32.6 miles in 2000. Since 1990 average trip length increased 364.4 miles, from 1,227.3 miles to 1,591.7 miles. This trend is expected to continue over the 12-year forecast period.

The average trip length is forecast to increase 15.0 miles in 2001, 13.5 miles in 2002, and 12.0 miles in 2003. For the balance of the forecast period--2004 through 2012--trip length increases average 8.7 miles a year. During this time, Latin American market trip length expands from 1,591.7 miles to 1,710.7 miles.

Average Aircraft Size

The average aircraft size in the Latin American market increased during the 1970s and early 1980s as widebody aircraft dominated the market, peaking at 220.2 seats in 1986. With the advent of the B-757 and other flying ETOPS since the mid 1980s, the average seat size has steadily declined. In 2000 the average aircraft size was 173.5 seats--a decline of 46.7 seats from 1986.

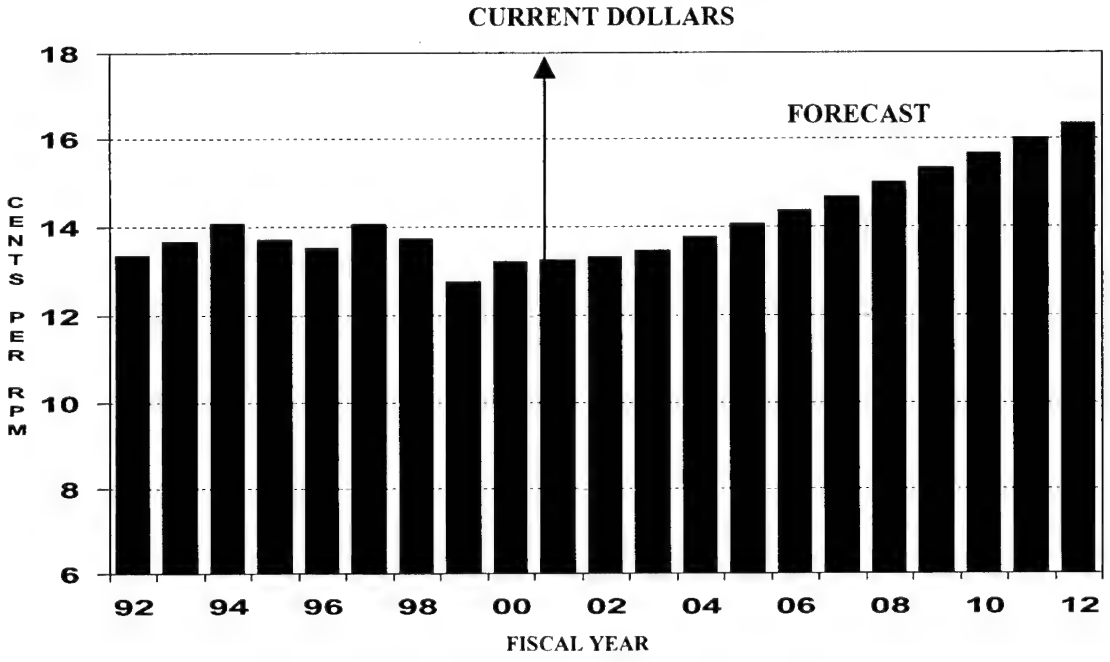
Over the 12-year forecast period, the average aircraft size in the Latin American market is expected to gradually increase as the major carriers expand the number of non-stop city-pair services into deep South America, and begin using larger two-engine widebody aircraft. The average aircraft size is forecast to increase to 185.0 seats by 2012--an increase of just under one seats per year.

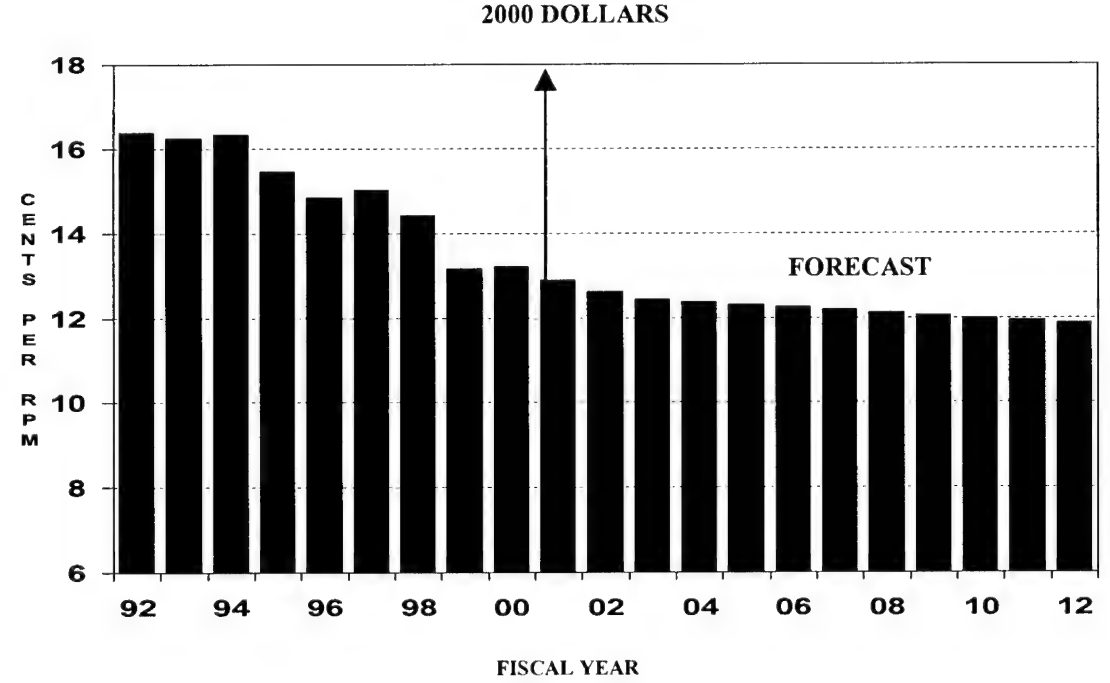
Passenger Load Factor

Load factors in the Latin American market showed little variability from 1987 through 1994, ranging from a low of 57.9 percent to 62.5 percent. From 1994 through 2000, the load factor increased almost 8.0 percentage points, expanding from 60.9 percent to 68.8 percent.

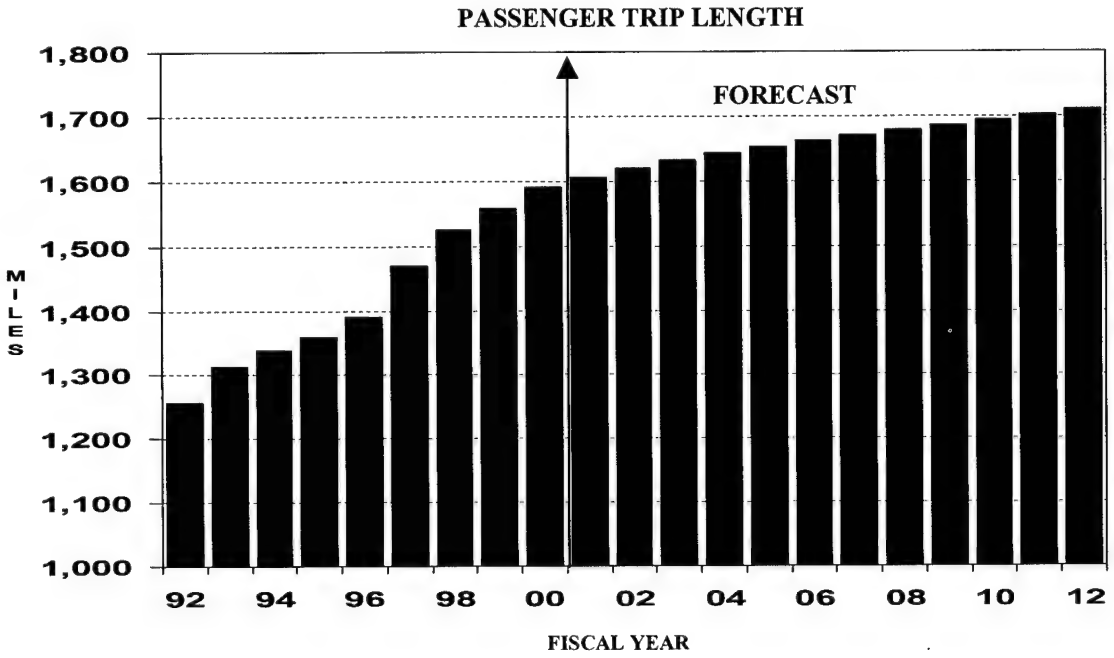
In 2000, RPM growth of 4.9 percent combined with capacity growth of only 0.5 percent pushed the load factor up to 68.8 percent--the highest average yearly level ever achieved in the Latin American market. In 1999, capacity increased 1.6 percent, while RPMs increased 6.5 percent, which resulted in the load factor increasing 3.0 percentage points to 65.9 percent.

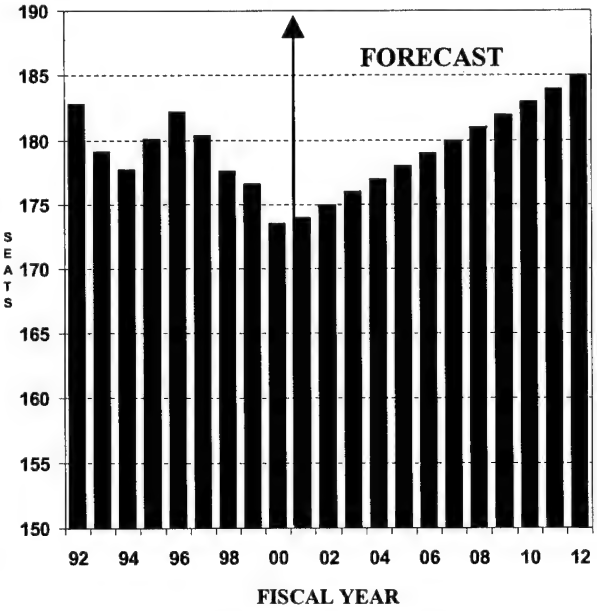
U.S. COMMERCIAL AIR CARRIERS: LATIN AMERICAN PASSENGER YIELDS

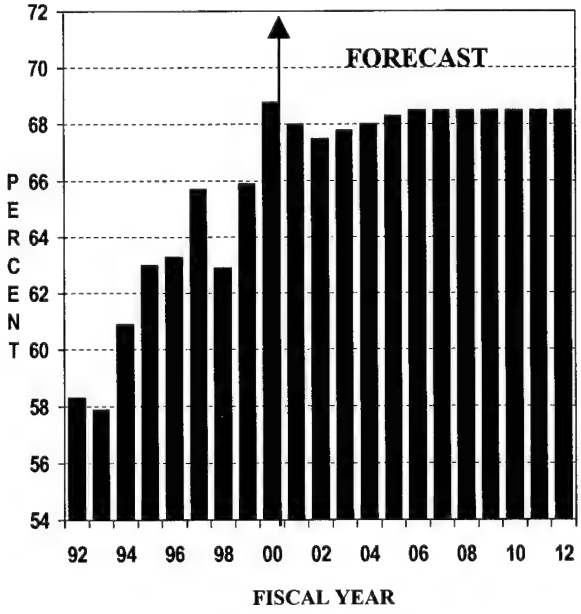




U.S. COMMERCIAL AIR CARRIERS: LATIN AMERICAN OPERATIONAL VARIABLES







Through 2002, large increases in capacity are forecast to occur which leads to a decrease in load factor over this period. ASMs are forecast to increase 9.4 percent in 2001, and 9.3 percent in 2002. Slower growth in RPMs in 2001 and 2002 will result in the load factor falling to 67.5 percent. After 2002, the load factor gradually increases during the next 4 years and levels off at 68.5 percent in 2006 and remains at this level for the balance of the forecast period as the market reaches equilibrium.

Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on INS data, total passengers in the Latin American market (South America, Central America/Mexico, and the Caribbean) grew 3.1 percent in CY 1999. Preliminary data indicate that total passengers grew 1.5 percent in 2000. The largest increase in 1999 occurred in the Central America/Mexico region, which was up 6.6 percent. The Caribbean region increased 4.6 percent, while the South American region decreased 4.5 percent. Despite the decrease in 1999, the South American region has been the fastest growing since 1990, with passengers increasing 8.4 percent annually. During this time, the Central America/Mexico market increased 5.4 percent per annum, while the Caribbean market increased only 1.4 percent a year.

U.S. air carriers' market share for the Latin American region has been increasing steadily since 1991. Between 1991 and 1996, U.S. air carriers' market share increased from 58.8 to 64.3 percent. Following a decline in share in 1997, U.S. carriers' market share has increased from 61.7 percent to 63.2 percent in 1999. The market shares for the Caribbean, Central America/Mexico, and South America in 1999 were 70.9, 59.2, and 59.7 percent, respectively.

Between 1990 and 1998 the percent of total passengers that were U.S. citizens traveling in the Latin American market decreased steadily from 67.3 percent to 63.4 percent. In 1999 the ratio increased to 64.8 percent.
Using the latest forecasts of GDP for the U.S. and Latin American regions, total passengers traveling in the Latin American market are expected to increase 6.6 percent in CY 2001 and 7.1 percent in 2002. Over the entire forecast period, total passengers increase 6.7 percent per year, from 39.4 million in 2000 to 86.2 million in 2012.

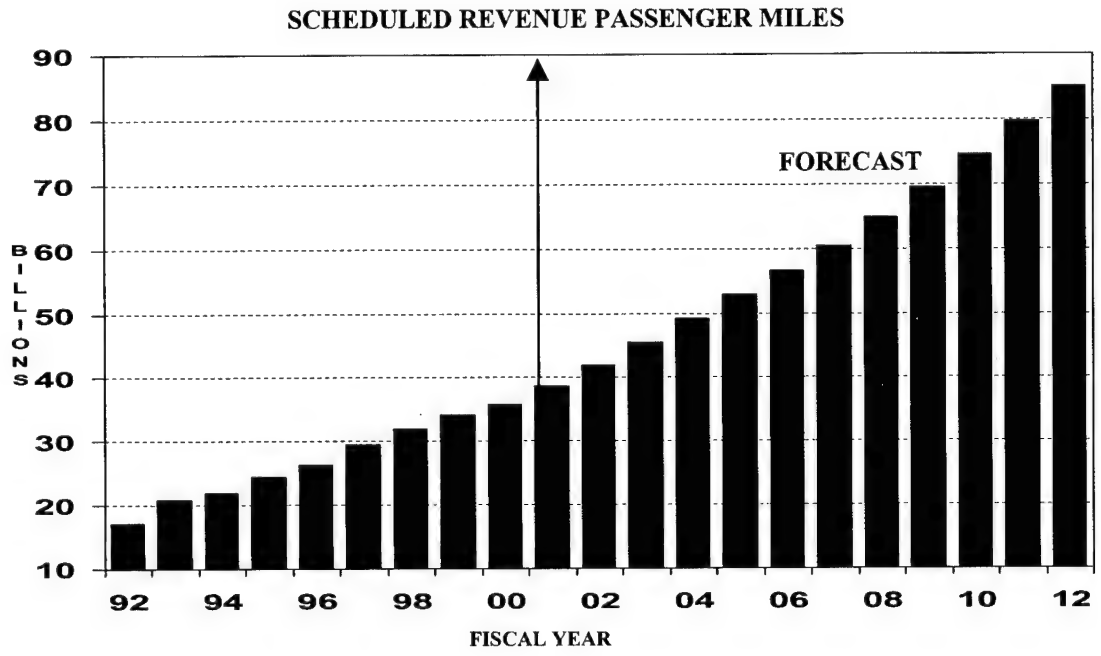
U.S. Flag Carriers' Passenger Enplanements

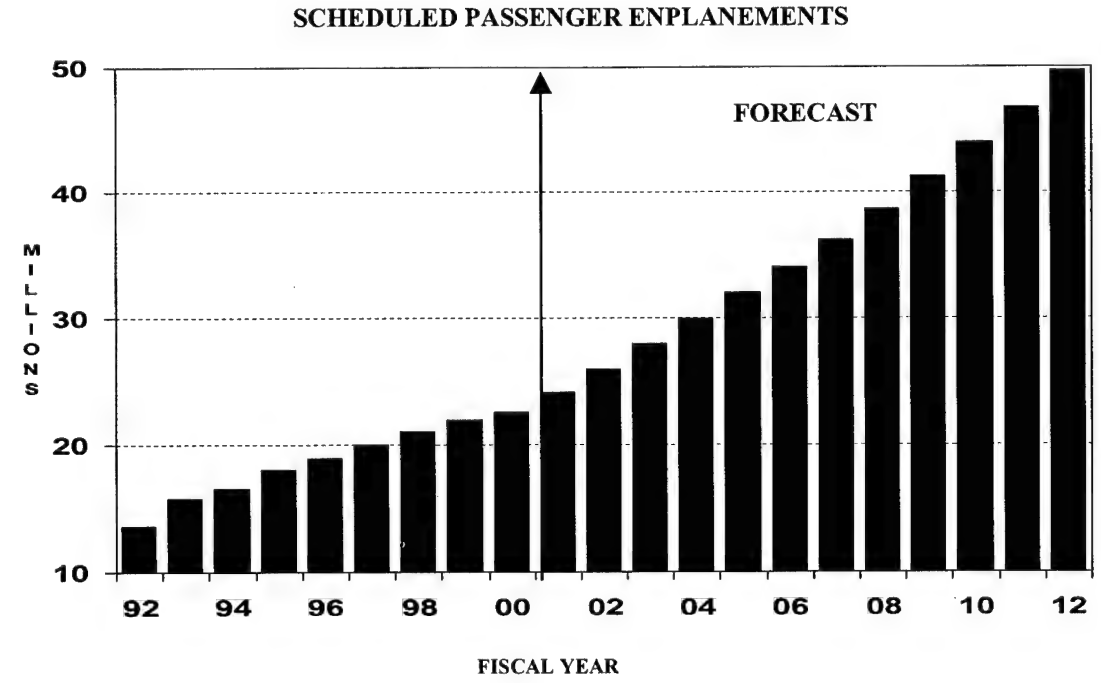
U.S. scheduled air carriers in the Latin American market enplaned a total of 22.5 million passengers in 2000, up 2.8 percent following 1999's increase of 4.2 percent. Latin American market passenger enplanements are forecast to increase 7.2 percent in 2001. The growth in enplanements is expected to average 6.8 percent annually during the 12-year forecast period, with the number of Latin American market enplanements reaching 49.7 million in 2012--more than double the level achieved in 2000.

U.S. Flag Carriers' Revenue Passenger Miles

Since 1993, Latin American market RPMs have been increasing due primarily to strong economic growth in the U.S. and Latin America and declining real yields. From 1993 through 2000, RPMs increased 8.1 percent a year. Latin American market RPMs totaled 35.8 billion in

U.S. COMMERCIAL AIR CARRIERS: LATIN AMERICAN FORECASTS





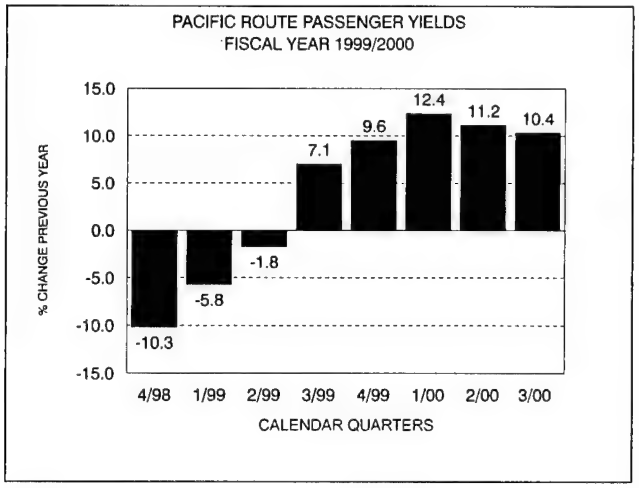
2000, up 4.9 percent from 1999. In 1999, RPMs grew 6.5 percent. Latin American RPMs are forecast to increase 8.1 percent in 2001. The average annual increase in RPMs over the 12-year forecast horizon is 7.5 percent, reaching 85.0 billion in 2012.

PACIFIC MARKET

U.S. Air Carriers' Yields and Operational Variables

Passenger Yields

A stronger Japanese yen and firming demand helped propel nominal yield in the Pacific market (9.99 cents) up 11.0 percent in 2000. Real yield in 2000 increased 7.6 percent. The gain in real yield followed declines of 4.5 and 11.9 percent in 1999 and 1998, respectively. The rise in yields is another indication that the market is recovering from the financial and economic problems that began in 1997.



Real yield is expected to decline 0.7 percent in 2001 and 0.5 percent in both 2002 and 2003. Over the balance of the forecast real yield decreases an average of 1.0 percent per year. Nominal yield during the forecast period increases from 9.99 cents in 2000 to 12.36 cents in 2012--an increase of 1.8 percent a year.

Passenger Trip Length

In 2000 the average passenger trip length in the Pacific market increased 656.5 miles following an increase of 539.9 miles in 1999. These large increases are the result of the restructuring of the route networks of the two dominant carriers in the region (United and Northwest) in April 1999, which eliminated a number of shorter intra regional routes. Since 1990 the average trip length increased from 3,718.0 miles to 5,219.9 miles--up 1,501.9 miles. However the increase in trip length between 1990 and 1998 was only 305.6 miles. The increase in average passenger trip length between 1990 and 1998 was primarily due to more direct flights and expanded service into the Asia/Pacific region. A return to more moderate increases in trip length similar to the 1990-1998 experience is expected to continue over the 12-year forecast period.

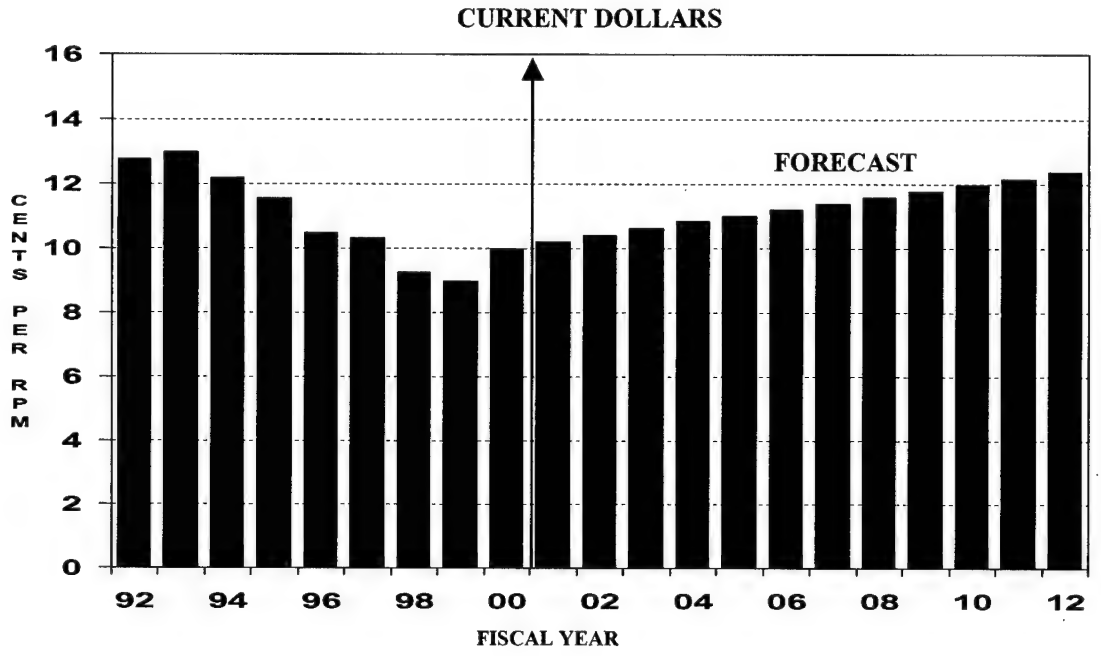
The average trip length is forecast to increase 60.0 miles in 2001 and 40 miles in 2002. For the remainder of the planning period--2003 through 2012--the average trip length increases 13 miles a year. For the 12-year forecast period, the Pacific market trip length increases 230 miles from 5,219.9 to 5,449.9 miles.

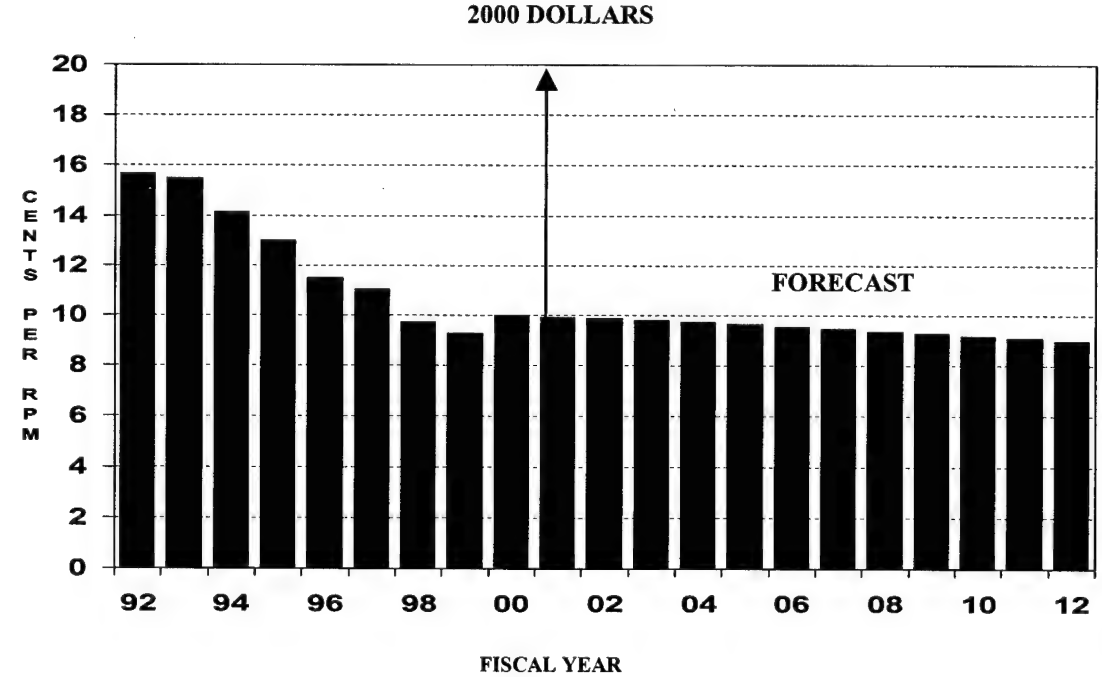
Average Aircraft Size

The average aircraft size in the Pacific market increased from 318.6 seats in 1990 to 329.1 seats in 1997. As traffic rapidly increased during this period, a large percentage of the additional capacity provided by the U.S. carriers came from adding larger B-747s to the routes.

When activity in the region began to shrink in 1998 due to the economic problems of the

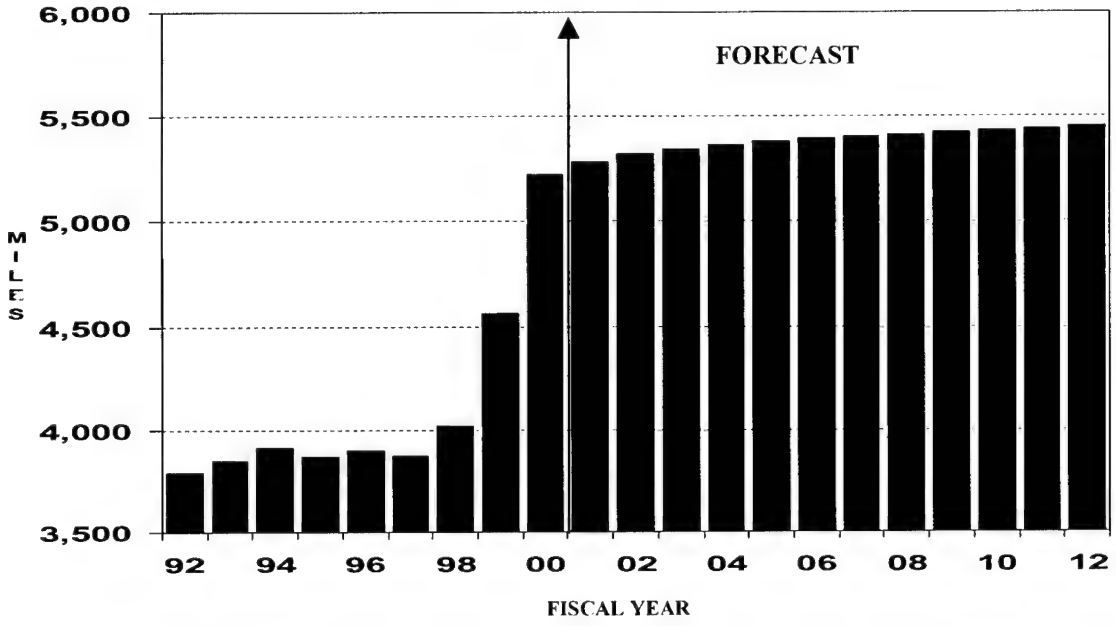
U.S. COMMERCIAL AIR CARRIERS: PACIFIC PASSENGER YIELDS



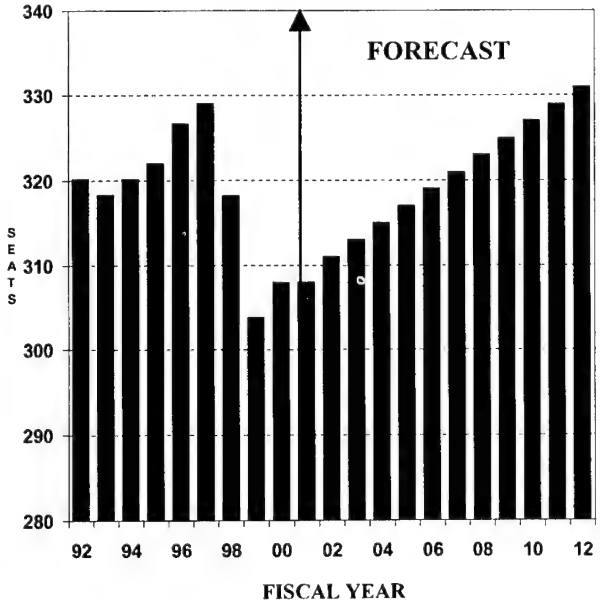


U.S. COMMERCIAL AIR CARRIERS: PACIFIC OPERATIONAL VARIABLES

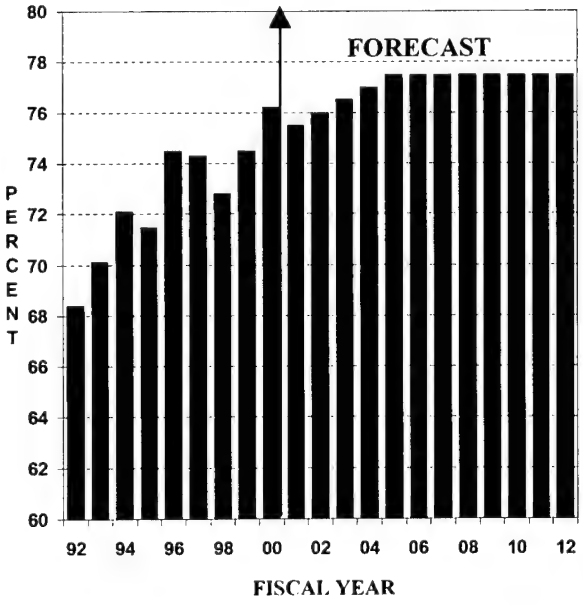
PASSENGER TRIP LENGTH



SEATS PER AIRCRAFT



LOAD FACTOR



region, U.S. carriers began shifting capacity to other markets. ASMs declined 5.4 percent in 1998 and 3.4 percent in 1999. The average number of seats per aircraft in the Pacific market declined 10.9 in 1998 and 14.4 in 1999.

Average seat size in 2000 increased by 4.2 seats and is expected to continue to grow through the remainder of the 12-year forecast period, as the carriers expand their fleets with larger widebody aircraft. The average aircraft size is forecast to increase from 308.0 seats in 2000 to 331.0 seats by 2012.

Passenger Load Factor

Between 1991 and 1997 the Pacific market load factor increased from 66.7 to 74.3 percent. In 1998 load factor fell 1.5 points as capacity declined 5.4 percent and RPMs fell 7.3 percent. Load factor increased 1.7 points in 1999, as capacity declined 3.4 percent, while RPMs fell only 1.1 percent. In 2000 load factor increased 1.6 points to a record 76.2 percent as traffic grew 4.2 percent--the first increase since 1998--while capacity increased 1.9 percent.

Load factor is forecast to decline to 75.5 percent in 2001 as capacity expands at a faster rate than RPMs. As traffic returns to its long-term growth path from 2002 to 2005, the load factor increases steadily from 76.0 percent in 2002 to 77.5 percent by 2005. The load factor is projected to remain at 77.5 percent for the period 2006 through 2012 as ASMs and RPMs expand at the same rate.

Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on INS data total passengers in the Pacific market increased 5.8 percent in CY 1999 following a decline of 6.4 percent in 1998. Preliminary 2000 data indicates that total passengers will increase about 9.5 percent to 26.5 million. After peaking in 1990, U.S. air carrier's market share has declined 15.1 percentage points to 40.0 percent in 1999.

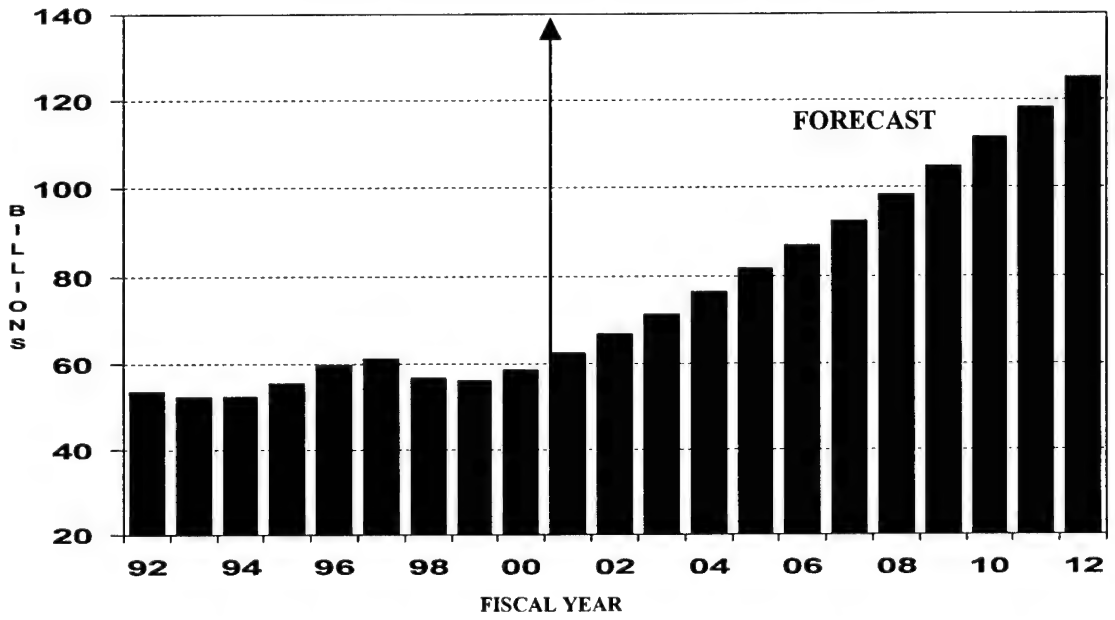
Using the latest forecasts of GDP for the U.S. and Pacific regions, total passengers traveling in the Pacific market are projected to increase 7.2 percent in CY 2001, 6.7 percent in 2002, and 6.3 percent in 2003. Over the entire forecast period total passengers increase at an average rate of 6.2 percent per year from 26.5 million in 2000 to 54.7 million in 2012.

U.S. Flag Carriers' Passenger Enplanements

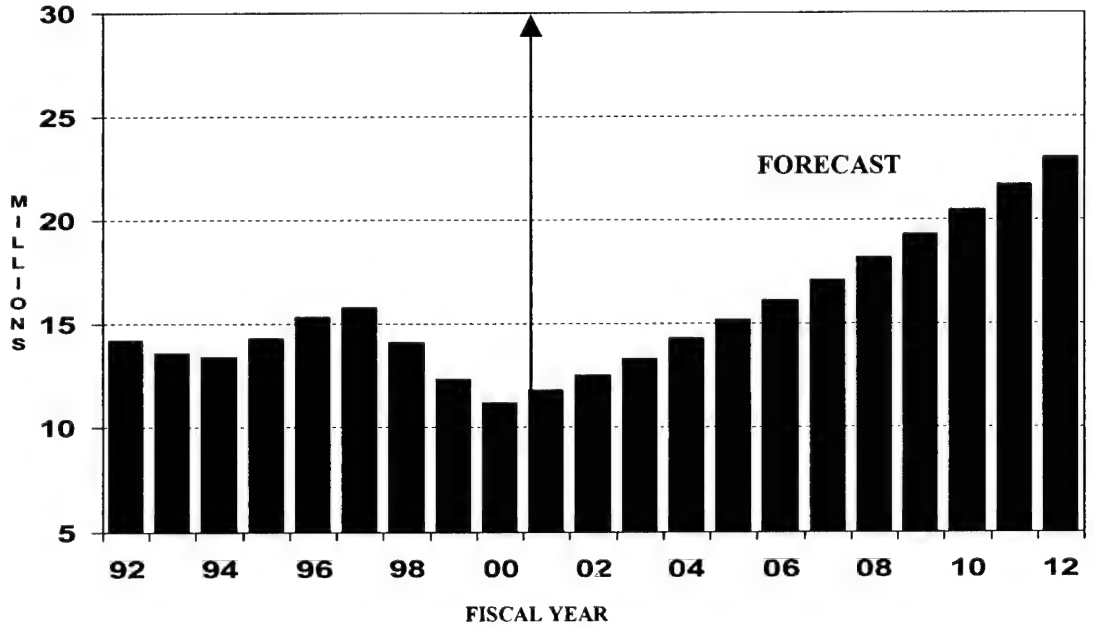
U.S. scheduled air carriers in the Pacific market enplaned a total of 11.2 million passengers in 2000, down 8.9 percent. This follows declines of 12.8 and 10.6 percent in 1999 and 1998, respectively. Enplanements decreased primarily due to a change in the route structures of the two dominant carriers in the region. Enplanement growth is forecast to return in 2001 with enplanements increasing 5.7 percent, then rising 6.1 percent in 2002, and 6.4 percent in 2003. Enplanement growth is projected to average 6.2 percent annually during the 12-year forecast period, with Pacific market enplanements reaching 23.0 million in 2012—more than double the number in 2000.

U.S. COMMERCIAL AIR CARRIERS: PACIFIC FORECASTS

SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



U.S. Flag Carriers'
Revenue Passenger Miles

Before the economic and financial problems developed in the Asia/Pacific region in 1997, U.S. air carrier traffic in the Pacific market was growing significantly faster than all other markets--both domestic and international. Between 1980 and 1997, RPMs were expanding at 8.4 percent a year--about double the rate of growth experienced in the domestic market. After declining in 1998 and 1999, RPMs increased 4.2 percent in 2000. Traffic in the Pacific market is forecast to increase 6.9 percent per year from 2001 to 2003, and 7.2 percent in 2004 as the economies of the region return to their long-term historical growth. The average annual increase in RPMs over the 12-year forecast is 6.6 percent, with RPMs totaling 125.1 billion in 2012.

U.S./CANADA TRANSBORDER TRAFFIC

The transborder forecasts shown in this document (Chapter X, Table 10) were developed with the use of Transport Canada's models and FAA's projections of expected growth in this market.

In CY 1995, the U.S. and Canada signed an open-skies agreement. Between 1995 and 1998, transborder traffic grew 8.8 percent a year. Transborder traffic growth is estimated to have moderated somewhat in 1999 and 2000, increasing at rates of 3.1 and 4.8 percent, respectively. For the 12-year forecast period transborder traffic increases from 20.6 million in CY 2000 to 32.9 million in 2012--an average of 4.0 percent a year.

AIR CARGO

Air cargo traffic is comprised of domestic and international revenue freight/express and mail. The demand for air cargo transportation is a derived demand resulting from economic activity. Cargo is moved in the bellies of passenger aircraft and in dedicated all-cargo aircraft, on both scheduled and nonscheduled service. In addition, a portion of the cargo activity, as reported on DOT Form 41, is handled exclusively by truck.

In 2000, the total number of domestic and international air cargo RTMs flown by U.S. commercial air carriers was 30.0 billion. The top five carriers accounted for approximately two-thirds of this total. The top five carriers in terms of RTMs and their percentage shares were: Federal Express (25.9 percent), United Parcel Service (14.2 percent), United Airlines (10.6 percent), Northwest Airlines (8.3 percent), and American Airlines (7.6 percent).

The total number of enplaned domestic and international air cargo tons at U.S. airports by U.S. commercial air carriers in 2000[9] was 16.6 million. The top five airports accounted for more than a quarter of the nation's enplaned cargo tonnage. The top five airports in terms of enplaned tons and their percentage shares were: Memphis International (8.2 percent), Louisville International (5.1 percent), Willow Run Detroit (4.9 percent), Los Angeles International (3.9 percent), and Indianapolis International (3.7 percent). Memphis and Louisville serve as hubs for Federal Express and United Parcel Service, respectively. Willow Run handles a large quantity of shipments related to the transportation industry. Los Angeles is a major international gateway. Indianapolis serves a hub for Federal Express and as an express mail hub for the U.S. Postal Service.

[9] 12 months ending June 2000.

HISTORIC FREIGHT/EXPRESS TONNAGE

Historic data were derived for domestic and international freight/express tonnage. The domestic figures represent enplaned domestic freight/express tons at U.S. airports on U.S. commercial air carriers. These data were compiled on a calendar year basis using the DOT Onboard T3 and T100 databases. (The domestic estimates include some transborder tonnage to Canada that is not reported separately.) Enplaned domestic freight/express tonnage grew from 6.4 million tons in 1990 to 10.8 million tons in 1999, an average annual increase of 5.9 percent. The 1999 level represents a 0.4 percent increase from the 10.7 million tons enplaned in 1998.

The international figures are enplaned and deplaned international freight/express tonnage at U.S. airports on U.S. and foreign flag carriers. These data were compiled on a calendar year basis using the DOT International T100 database. International freight/express tonnage on U.S. and foreign flag carriers grew from 3.9 million tons in 1990 to 7.1 million tons in 1999, an average annual increase of 7.0 percent. The 1999 level represents an increase of 2.3 percent from 7.0 million tons in 1998. The U.S. flag carrier portion of the total international tonnage has increased from 40.3 percent in 1990 to 42.2 percent in 1999. The distribution of total tonnage for U.S. and foreign flag carriers by world region in 1999 was: Atlantic (41.0 percent), Pacific (36.5 percent), Latin America (21.3 percent), and Canada (1.2 percent).

REVENUE TON MILES

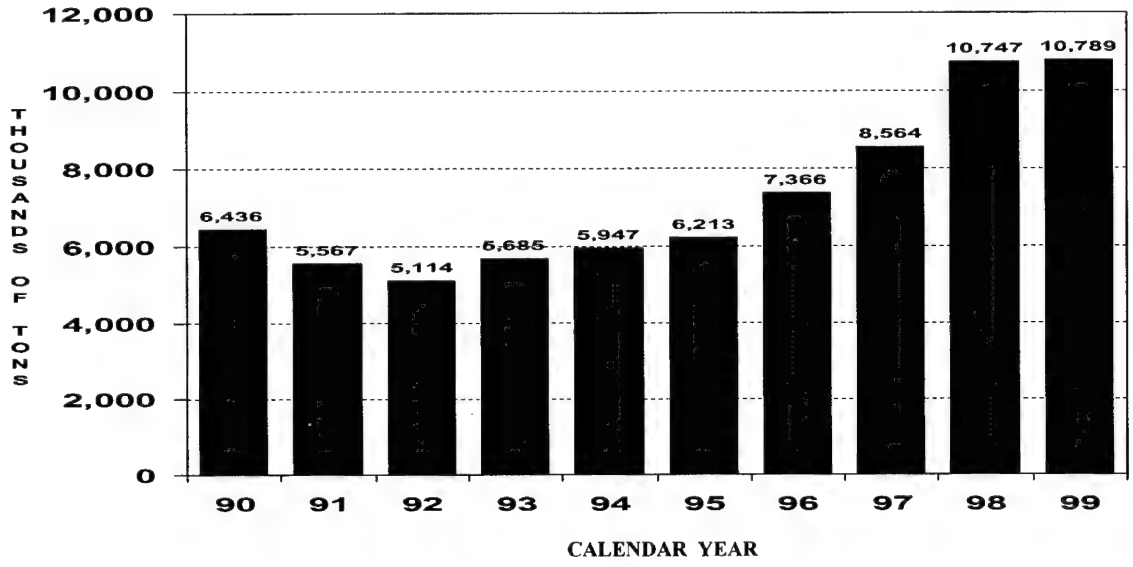
Historic data and forecasts are presented for domestic and international freight/express and domestic and international mail RTMs. In addition, within each of these four components trends and forecasts are presented for all-cargo carriers and passenger carriers. Passenger carriers transport cargo predominantly in the bellies of their aircraft.

Historically, air cargo activity has been highly correlated with GDP. Additional factors that have affected the growth in air cargo traffic include declining real yields, improved productivity, and globalization. In the future, other factors that could potentially stimulate demand for air cargo include increased market opportunities from open skies agreements, decreased costs from global airline alliances, and increased business volumes attributable to e-commerce. Factors that could potentially limit growth include increased use of e-mail, decreased costs of sending documents via facsimile, and the increased costs to airlines in meeting environmental restrictions.

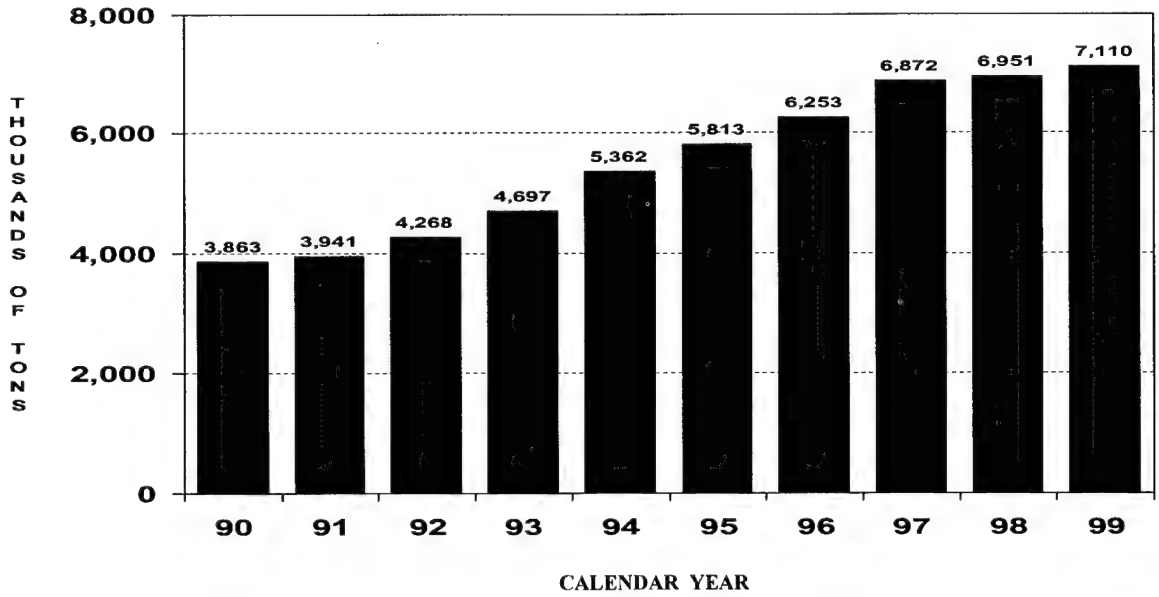
Forecasts of domestic freight/express and mail RTMs were developed from regression equations using real U.S. GDP as the independent variable. Projections of international freight/express and mail RTMs were derived from equations that related these variables to world GDP, adjusted for inflation. This methodology implicitly assumes that adequate capacity will be available and that other influences will impact cargo in a manner similar to that in the past. The distribution of RTMs between passenger carriers and all-cargo carriers was forecast based on an analysis of historic trends in shares and discussions with industry representatives.

From 1990 to 2000, total cargo flown on U.S. commercial air carriers increased from 16.3 billion to 30.0 billion RTMs. This growth, which averaged 6.3 percent per year, was faster than the rate of growth in passengers. The fastest growing component of air cargo activity has been international freight/express, which increased an average of 8.1 percent annually from 1990 to 2000.

ENPLANED DOMESTIC FREIGHT/EXPRESS TONS



ENPLANED/DEPLANED INTERNATIONAL FREIGHT/EXPRESS TONS AT U.S. AIRPORTS



Growth in domestic freight/express RTMs, which averaged 4.9 percent annually between 1990 and 2000, has been dominated by all-cargo carriers. These carriers have significantly increased their market share, accounting for more than three-quarters of domestic freight/express RTMs in 2000. Federal Express and United Parcel Service are the two largest domestic all-cargo carriers. Both of these carriers are integrated carriers who provide door-to-door service using intermodal systems.

Revenue Ton Miles Forecast

The total number of air cargo RTMs flown by U.S. commercial air carriers was 30.0 billion in 2000, an increase of 6.7 percent over 1999. Total RTMs are forecast to increase to 59.1 billion in 2012. This represents a 5.8 percent average annual increase from 2000 to 2012.

Freight/Express Revenue Ton Miles

Total freight/express RTMs flown by U.S. commercial air carriers was 26.9 billion in 2000, a 7.1 percent increase from 1999. Domestic freight/express RTMs, which increased by 5.3 percent in 2000 to 12.1 billion, is forecast to increase to 22.2 billion in 2012. This represents an average annual growth rate of 5.2 percent over the 12-year forecast period. Historically all-cargo carriers have increased their share of domestic freight/express RTMs flown, from 61.3 percent in 1990 to 78.5 percent in 2000. This has resulted from the significant growth of express service by Federal Express and United Parcel Service and the lack of growth of domestic freight/express business for passenger carriers. These carriers have increased passenger load factors almost 10 percentage points since 1990 and thus are increasingly using belly capacity for passenger luggage. The trend in market shares is expected to continue throughout the forecast period, resulting in a forecast market share for the all-cargo carriers of 87.7 percent in 2012.

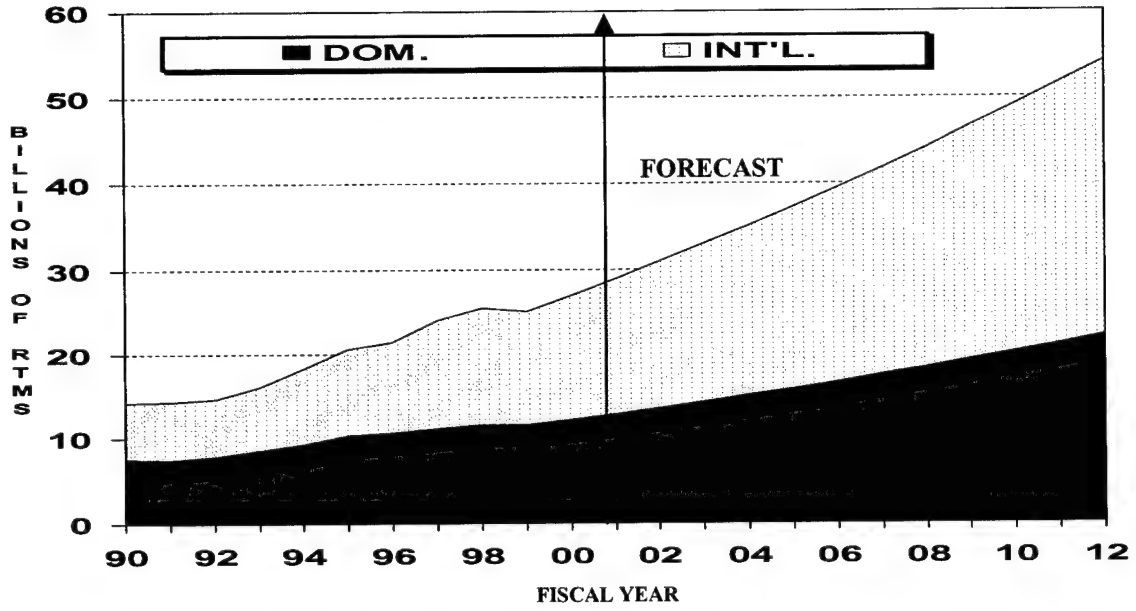
International freight/express RTMs increased to 14.8 billion in 2000, an increase of 8.6 percent from 1999. International freight/express RTMs are forecast to increase by an average of 6.7 percent over the entire forecast period to 32.0 billion. This forecast is based on the projected strong economic growth in world GDP, especially in the Latin America and Asia/Pacific regions. The all-cargo carriers increased their share of international freight/express RTMs flown from 48.6 percent in 1990 to 57.1 percent in 1998. This share declined to 50.7 percent by 2000, due in part to a shortage of all-cargo capacity. All-cargo carriers share of international freight/express RTMs is forecast to increase to 60.3 percent by 2012.

Mail Revenue Ton Miles

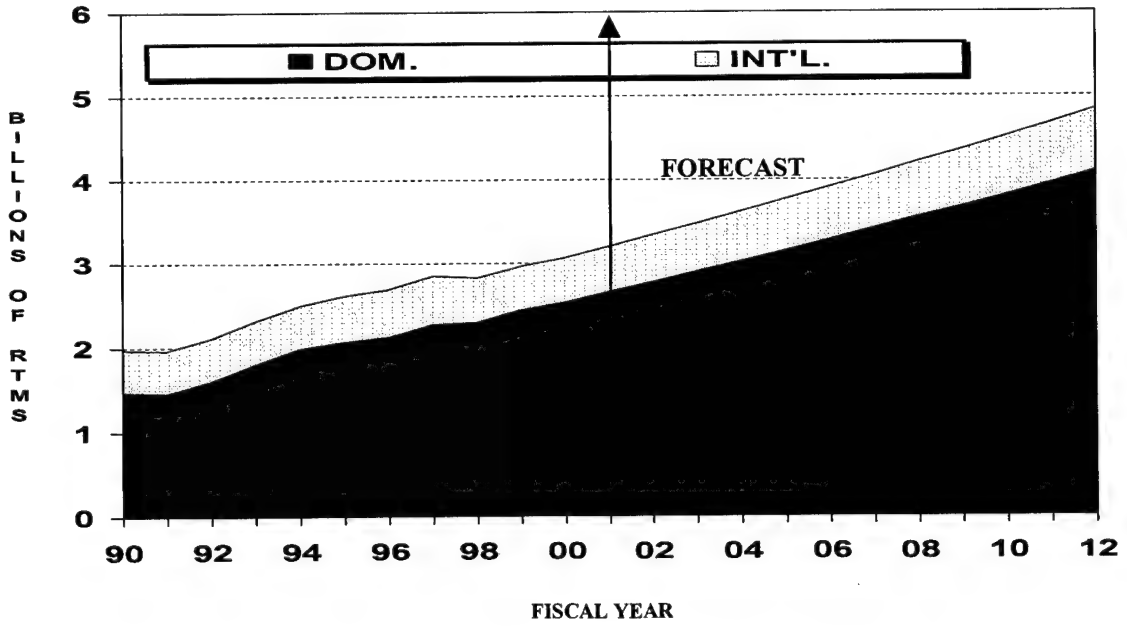
Total mail RTMs flown by U.S. commercial air carriers was 3.1 billion in 2000, an increase of 3.5 percent from 1999. Domestic mail increased by 3.3 percent in 2000 to 2.5 billion RTMs. Domestic mail is forecast to grow an average of 4.1 percent per year over the forecast period. The forecasted total for domestic mail RTMs in 2012 is 4.1 billion. Historically passenger carriers have accounted for the majority of domestic mail RTMs. The all-cargo carriers have increased their share, though, from 3.8 percent in 1990 to 28.5 percent in 2000. This trend has resulted from the increased use of all-cargo carriers such as Emery Worldwide by the U.S. Postal Service as a means to improve control over delivery. Factors cited by the U.S. Postal Service in determining the use of all-cargo versus passenger carriers includes capacity, availability, and on-time performance. The all-cargo share of domestic mail is forecast to increase to 35.7 percent by 2012.

U.S. COMMERCIAL AIR CARRIERS: REVENUE TON MILES

FREIGHT/EXPRESS



MAIL

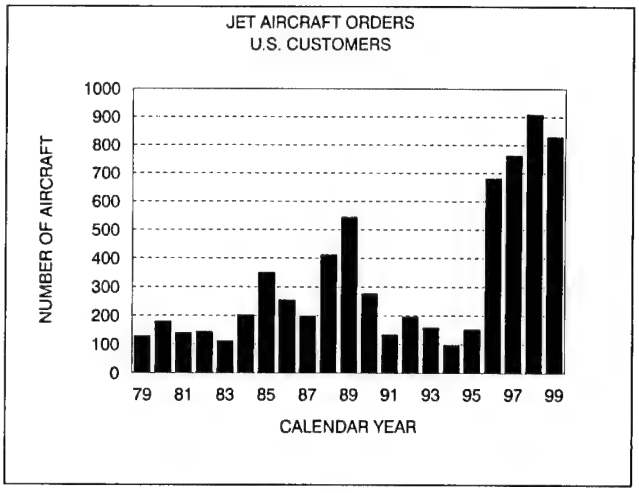


International mail totaled 531.9 million RTMs in 2000. This represented an increase of 4.4 percent from 1999. International mail is forecast to grow an average of 2.8 percent per year between 2000 and 2012. The projected total for international mail RTMs in 2012 is 745.2 million. Passenger carriers have increased their share of international mail from 84.9 percent in 1990 to 92.9 percent in 2000. Historically, passenger carriers have been able to handle the volume of international mail at lower rates than the all-cargo carriers. According to the U.S. Postal Service, the current share distribution between the passenger carriers and the all-cargo carriers is not likely to change significantly in the future. Consequently, the market shares by carrier group for international mail were held constant for the forecast period at their 2000 levels.

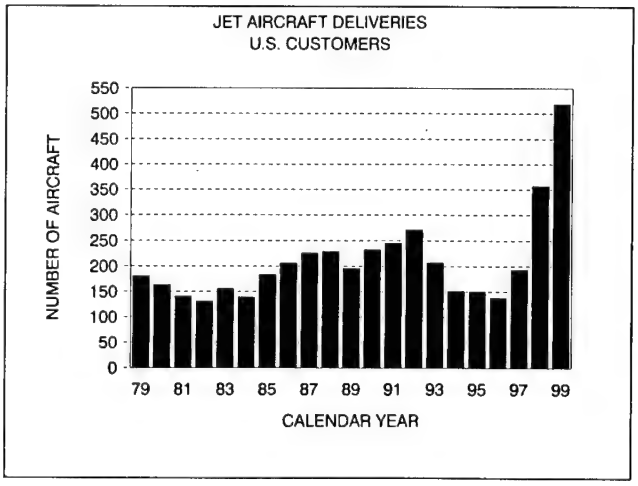
AIR CARRIER FLEET

U.S. air carriers placed orders for an estimated 831 jet aircraft during CY 1999 continuing the boom in aircraft orders that began in 1996. The 831 orders are the second highest total ever made by the industry, surpassed only by the 1998 total of 911. The number of orders placed during the past three years (2,507) is greater than the number placed during the prior 8-year period, 1989 through 1996. During the past 40 years, the average number of orders per year was 260.

A majority of the orders, 489 aircraft (58.8 percent), were for narrowbody two-engine aircraft (A-318/319/320/321 and B-717/737/757). Regional jet orders (CRJs, EMBs, and Fairchild/Dornier) accounted for 34.1 percent of the total (283 aircraft). Orders for two-engine (A-300/330 and B-767/777) widebody aircraft totaled 52 (6.2 percent) in 1999.



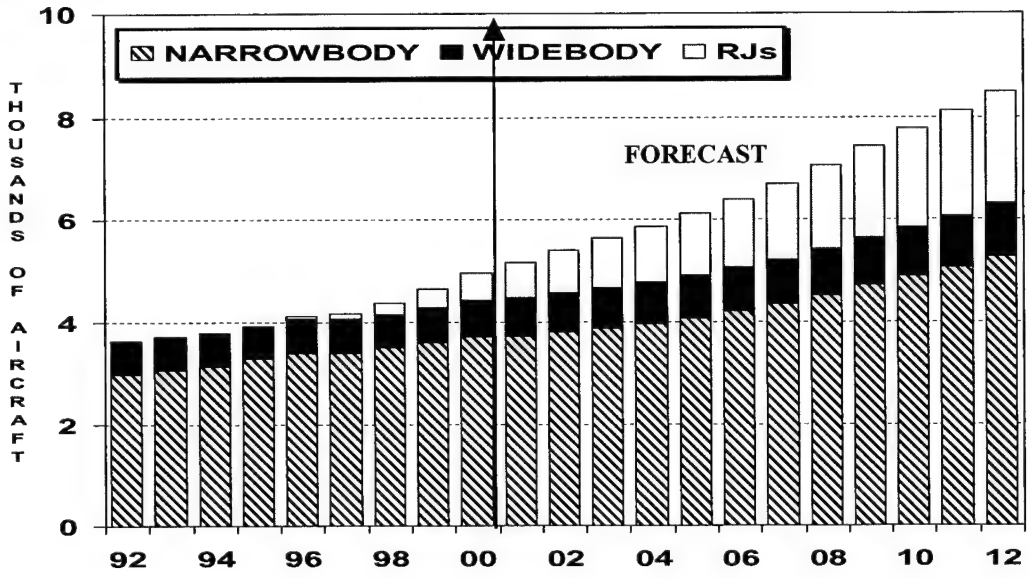
Aircraft manufacturers delivered 519 jet aircraft to U.S. customers in CY 1999--the largest number of deliveries ever. Of this total, 290 (55.9 percent) were two-engine narrowbody aircraft, 60 (11.6 percent) were for two-engine widebody aircraft, and 140 were for regional jets (27.0 percent).



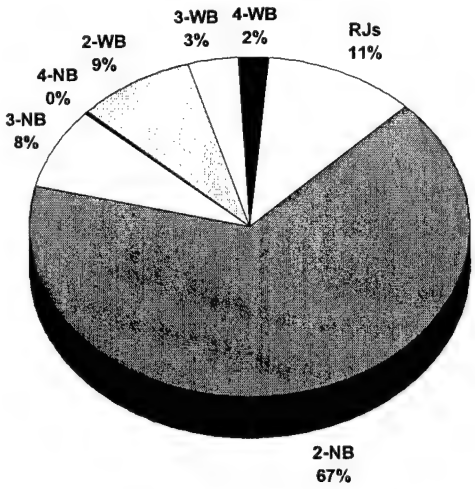
Passenger Jet Aircraft

In CY 2000, the fleet of passenger jet aircraft for U.S. air carriers expanded by an estimated 309 aircraft, the largest yearly increase during the past 10 years. As expected, there was a large increase in two-engine narrowbody aircraft (up 160 aircraft or 5.1 percent), two-engine widebody aircraft (up 71 or 19.7 percent), and regional jets (up 182 aircraft or 49.9 percent).

U.S. COMMERCIAL AIR CARRIERS: PASSENGER JET AIRCRAFT



PERCENT BY AIRCRAFT TYPE



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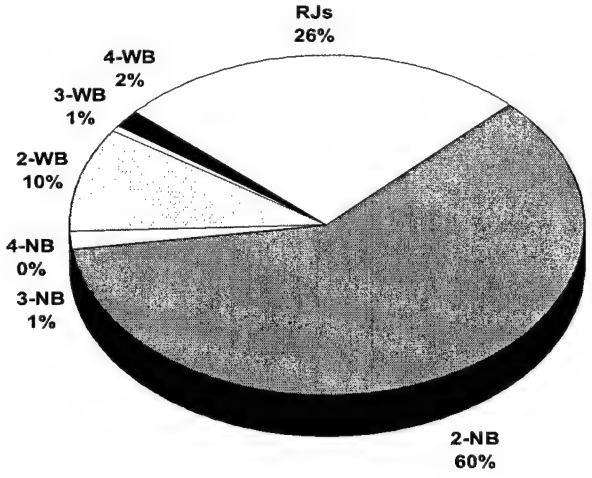


2012

Based on the backlog of aircraft orders and the projections of air carrier traffic, seat capacity, load factors, fleet requirements, and aircraft productivity, the U.S. commercial air carrier passenger fleet is projected to increase from an inventory of 4,964 aircraft in 2000 to 8,503 aircraft by 2012. This involves a net addition to the fleet (after retirements of obsolete aircraft) of approximately 295 aircraft annually.

The two-engine narrowbody fleet is projected to grow by an average of 153 aircraft annually. By 2012, two-engine narrowbody aircraft are expected to account for 60.3 percent of the fleet, down from 66.5 percent in 1990. The number of three-engine narrowbody (B-727) aircraft declines from 378 aircraft (7.6 percent of fleet) in 2000 to 127 (1.5 percent of fleet) by 2012. The number of four-engine narrowbody aircraft remains constant through the forecast period at 19 aircraft.

The two-engine widebody fleet (A-300/310/330 and B-767/777) is the fastest growing of the widebody group. This group is expected to increase by an average of 34 aircraft per year (5.7 percent), expanding from 432 aircraft in 2000 to 840 aircraft in 2012. The three-engine widebody fleet (MD-11, DC-10, and L-1011) is projected to shrink at an average annual rate of 8.6 percent, from 171 aircraft in 2000 to 58 aircraft in 2012.

Four-engine widebody (B-747 and A-340) aircraft are forecast to increase from 118 aircraft in 2000 to 140 aircraft in 2012, an annual average increase of 1.4 percent. There are currently no U.S. customers for the proposed large A-380 aircraft (formerly referred to as the A-3XX), and our current forecast does not project any of these aircraft entering the U.S. fleet during the forecast period. However if the program is launched, it would not be surprising if U.S. customers did order a handful of these very large aircraft.

The regional jet fleet consisting of aircraft ranging in size from 35 to 70 seats, is forecast to expand from 547 aircraft in 2000 to 2,190 aircraft in 2012, an increase of 12.3 percent a year. By 2012 the regional fleet will account for 25.8 percent of the total passenger jet fleet. In 2000, the regional jet fleet accounted for only 11.0 percent of the fleet.

Cargo Jet Aircraft

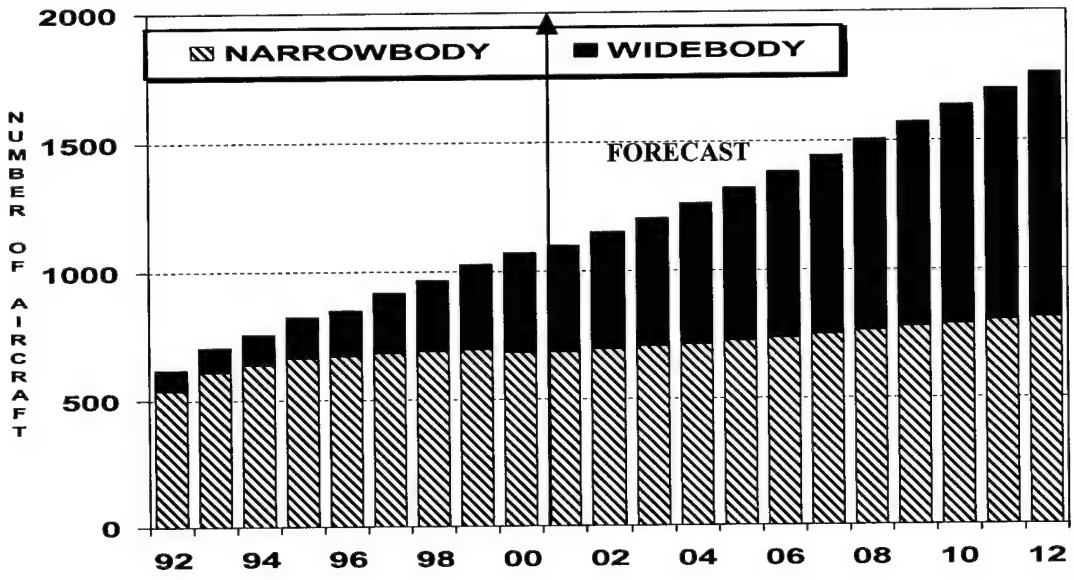
In CY 2000, the jet fleet of U.S. air carrier cargo aircraft increased by 4.3 percent to 1,073 aircraft. Based on the backlog of aircraft orders and the projections of air cargo demand, the U.S. commercial cargo fleet is projected to increase to 1,760 aircraft by CY 2012. This involves an average net addition to the fleet (after retirements of obsolete aircraft) of 57 aircraft annually or 4.2 percent per year.

Narrowbody aircraft, which accounted for 63.7 percent of the cargo fleet in 2000, are projected to account for 46.1 percent in 2012. The fleet of two-engine narrowbody aircraft is expected to increase from 167 aircraft in 2000 to 286 aircraft in 2012, an average annual increase of 4.6 percent.

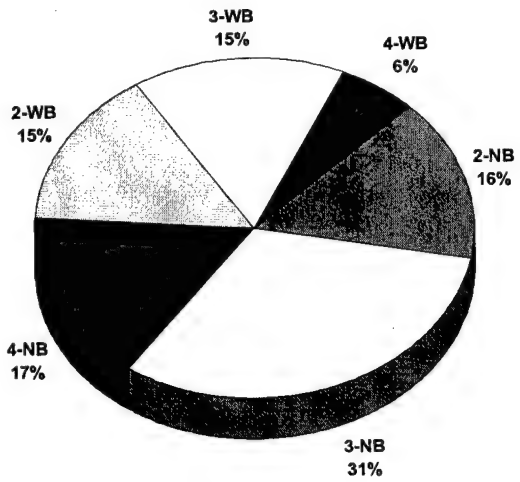
The number of three-engine narrowbody aircraft is expected to grow from 339 aircraft in 2000 to 348 aircraft in 2012. The number of four-engine narrowbody aircraft is expected to remain relatively constant over the forecast period, totaling 178 aircraft in 2012.

Widebody aircraft accounted for 36.3 percent of the cargo fleet in 2000. The fleet of widebody aircraft is forecast to increase to 53.9 percent of the cargo fleet in 2012. The largest increase in the number of widebody aircraft is projected to occur in the two-engine widebody category. This category is expected to grow by an average of 32 aircraft per year (10.8 percent annually),

U.S. COMMERCIAL AIR CARRIERS: CARGO JET AIRCRAFT



PERCENT BY AIRCRAFT TYPE



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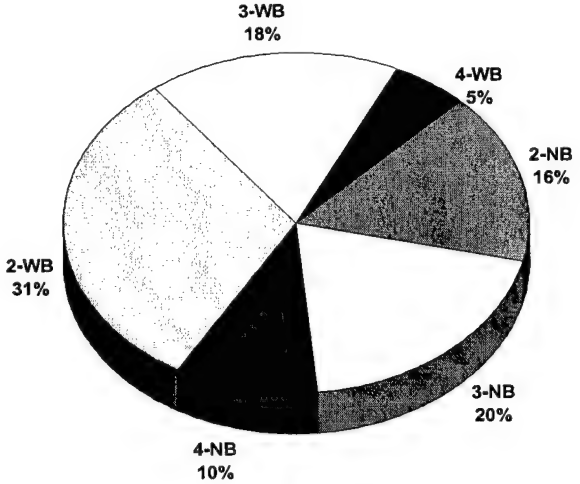
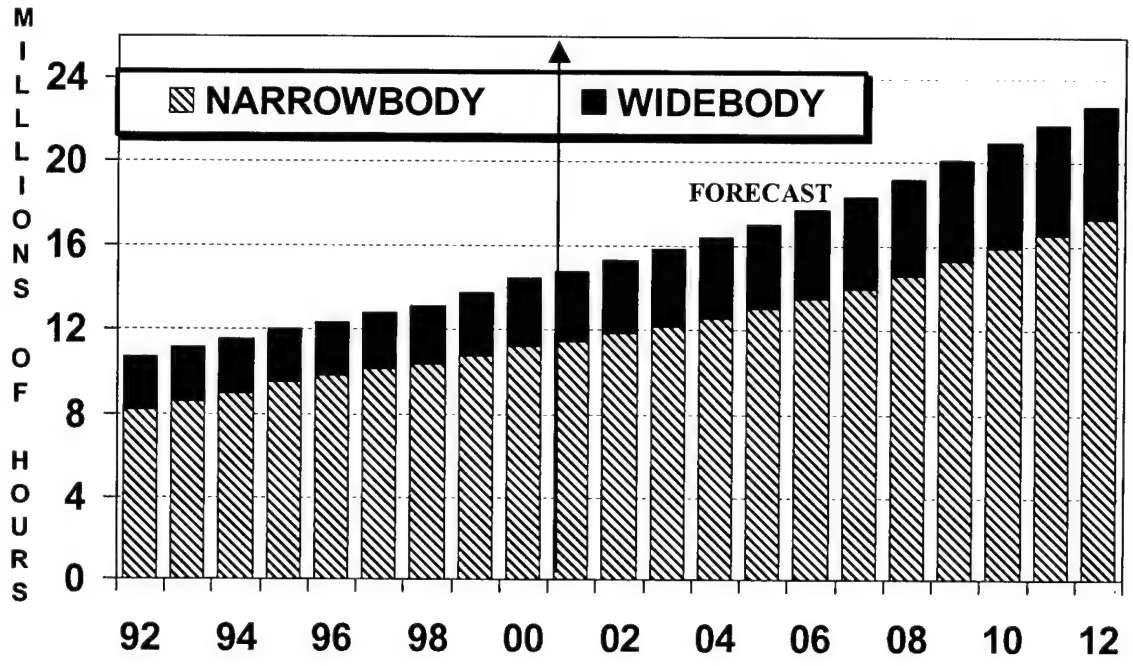
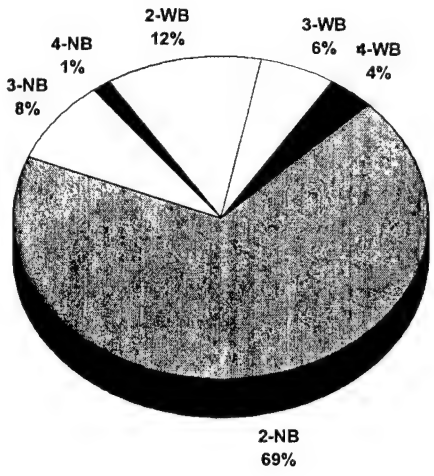


2012

U.S. COMMERCIAL AIR CARRIERS: AIRBORNE HOURS 1/



PERCENT BY AIRCRAFT TYPE



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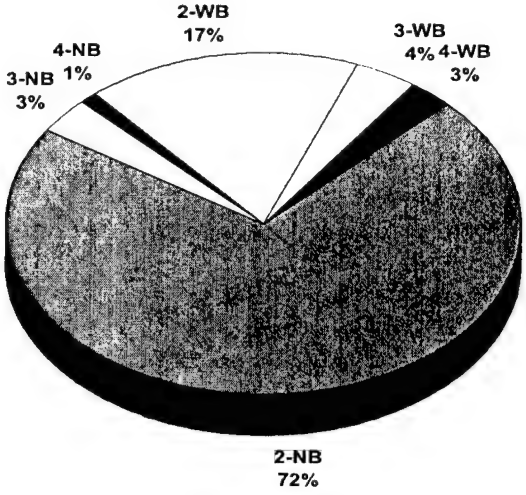


2012

1/Includes both passenger (excluding regional jets) and cargo aircraft.

expanding from 160 aircraft in 2000 to 548 aircraft in 2012.

The three-engine widebody fleet is projected to increase from 166 aircraft in 2000 to 308 aircraft in 2012. This represents an average annual increase of 12 aircraft or 5.3 percent per year. Conversions of DC-10 passenger aircraft to MD-10's and new MD-11F orders drive the growth in this category. The number of four-engine widebody aircraft is forecast to increase from 63 aircraft in 2000 to 92 aircraft in 2012, an average annual increase of 3.2 percent.

AIRBORNE HOURS

U.S. large commercial air carriers (passenger and cargo but excluding regional jets) flew an estimated total of 14.4 million hours in 2000, up from 13.7 million hours in 1999. Two aircraft categories accounted for more than 80 percent of total airborne hours: two-engine narrowbody (68.7 percent), and two-engine widebody (12.2 percent).

In 2012, the total number of hours is forecast to expand to 22.7 million, an average annual increase of 3.9 percent. Airborne hours are projected to increase 2.3 percent in 2001 to 14.7 million, and 3.9 percent in 2002, to 15.3 million.

Two-engine aircraft (both narrowbody and widebody) are expected to account for 89.2 percent of all airborne hours flown in 2012. Narrowbody two-engine aircraft hours, which make up 71.8 percent of total hours in 2012, increase, on average, 4.3 percent per year. Widebody two-engine aircraft hours, which account for 17.4 percent of total hours in 2012, increase 7.0 percent per year. Four-engine widebody aircraft hours flown are forecast to increase at an average annual rate of 1.8 percent.

The number of hours flown by three-engine aircraft is projected to decline through 2012. Three-engine widebody hours flown are expected to remain essentially flat, increasing just 0.1 percent a year. Although the fleet of three-engine widebody aircraft is forecast to increase over the forecast period, the growth in this aircraft category occurs among cargo operators. Cargo utilization rates for hours are typically lower than utilization rates for passenger applications. Three-engine narrow-body aircraft hours are forecast to fall 3.8 percent annually, reflecting the retirement of large numbers of B-727 aircraft. The share of total hours flown by three-engine aircraft will decrease from 14.3 percent in 2000 to 7.1 percent in 2012. Hours for the four-engine narrowbody fleet, made up primarily of DC-8 cargo aircraft, increase slowly at a rate of 0.3 percent a year.

CHAPTER IV
REGIONALS/COMMUTERS

CHAPTER IV

REGIONALS/COMMUTERS

The regional/commuter airline industry, for the purpose of this forecast, is defined as those air carriers that provide regularly scheduled passenger service and whose fleets are composed primarily of aircraft having 60 seats or less. During 2000, 90 regional/commuter airlines reported traffic data to the Department of Transportation (DOT), Office of Airline Information, either on DOT Form 298-C or Form 41.

The FAA historical regional/commuter database includes activity for all U.S. regional/commuters operating in the 48 contiguous states, Hawaii, Puerto Rico, and the U.S. Virgin Islands. In addition, it includes activity for Alaska, transborder Canada and Mexico, and the Caribbean.

Additionally, the regional/commuter traffic statistics include duplicated enplanement and revenue passenger miles (RPMs) data for certain operators that are also included in the commercial air carrier traffic statistics. This duplication results from regional/commuter carriers who operate both large turboprops and turbojets with over 60 seats as well as commuter type aircraft with less than 60 seats. The level of duplicated traffic (enplanements and RPMs) is presented in the technical notes at the beginning of Chapter X for Tables 11 (air carriers) and Tables 24 and 25 (regionals/ commuters). In 2000, a total of nine carriers reported for all, or part of the year, on DOT Form 41.[1] In the discussions that follow, references and/or distinctions will be made between the following two carrier groupings: (1) Form 298-C carriers--operate only aircraft with 60 seats or less; and (2) Form 41 carriers--operate both large aircraft over 60 seats and smaller regional/commuter aircraft.

REVIEW OF 2000

The number of regional/commuter airlines totaled 90 in 2000, down from 92 carriers in 1999 and 102 in 1998. While the number of reporting airlines has declined significantly over the past decade (151 carriers in 1990), industry traffic has more than doubled over the same period (enplanements up 110.8 percent). However, Form 298-C traffic statistics understate the level of growth in enplanements since 1997. This results from the fact that carriers reporting on Form 298-C are only

[1] American Eagle (includes Flagship, Simmons, and Wings West), Atlantic Southeast, Comair (beginning in May 2000), Continental Express, Executive, Horizon, Mesaba , Trans States, and United Feeder Service (last reported traffic, February 2000).

required to report originating passengers while carriers reporting on Form 41 report both originating and connecting passengers. This difference did not become a significant issue until regional carriers began to service more markets involving multiple flight segments.

While it is difficult to ascertain the level of undercounting for all 298-C carriers, the problem is thought to be most acute with Comair and Atlantic Coast Airlines—two carriers with increased levels of hubbing activities. A comparison of enplanements and originating passenger data for these two carriers indicated that enplanements were understated by just over 751,000 in 1997, by over 1.1 million in 1998, and by almost 1.8 million in 1999. Therefore, the 298-C database has been revised to account for these differences. This will not be as much of a problem in the future since Comair is now reporting its traffic data on Form 41. However, we will continue to estimate connecting passengers for Atlantic Coast and other carriers as alternative data sources become available.

Another problem identified and corrected concerns the reporting of Chicago Express traffic statistics. In this case, all of the carrier's available capacity is purchased and resold by American Trans Air (wet-leased), and all the traffic flown by Chicago Express is reported in the larger carrier's Form 41 filing as its own. The traffic flown by Chicago Express for 1997 through 2000 has been separated from American Trans Air's statistics and included in the Form 41 regional/commuter database.

FINANCIAL RESULTS

The regional/commuter airline industry again posted solid financial results in 2000. Industry operating revenues increased almost 12.6 percent in 2000 to just under $8.0 billion. During the same period, operating expenses increased just under 17.7 percent to $7.4 billion. This still resulted in an operating profit of $546.2 million. Through the end of fiscal year 2000, the regional/commuter industry has posted a string of 19 consecutive quarters of improving levels of operating profits.

The nine regional Form 41 air carriers' operating profit totaled $341.4 million in 2000, or 62.5 percent of the total industry operating profit. The 81 298-C regional/commuter carriers posted an operating profit of $204.8 million. However, a large part of the regional/commuter industry's operating profits was accounted for by a relatively small number of carriers, while a vast majority of the smaller operators contributed very little to industry profitability. This raises concern about the continued viability of some of the smaller 298-C operators.

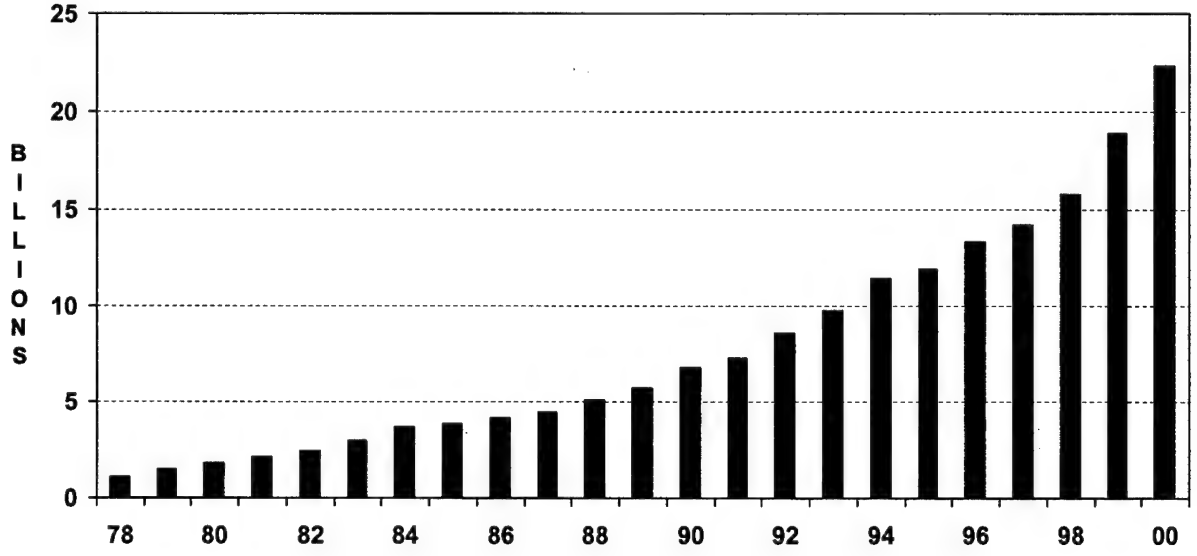
Regional/commuter passenger yields in 2000 were almost two-and-a-half times higher than those of the larger air carriers. Form 41 regional air carriers' yield decreased from 36.2 cents in 1999 to 33.7 cents in 2000, a decline of 6.9 percent. This decline is due, in large part, to the greater efficiencies achieved by regional jets. Passenger yield for the 298-C air carriers increased from 35.0 cents in 1999 to 36.7 cents in 2000, up 4.9 percent.

REVENUE PASSENGER ENPLANEMENTS

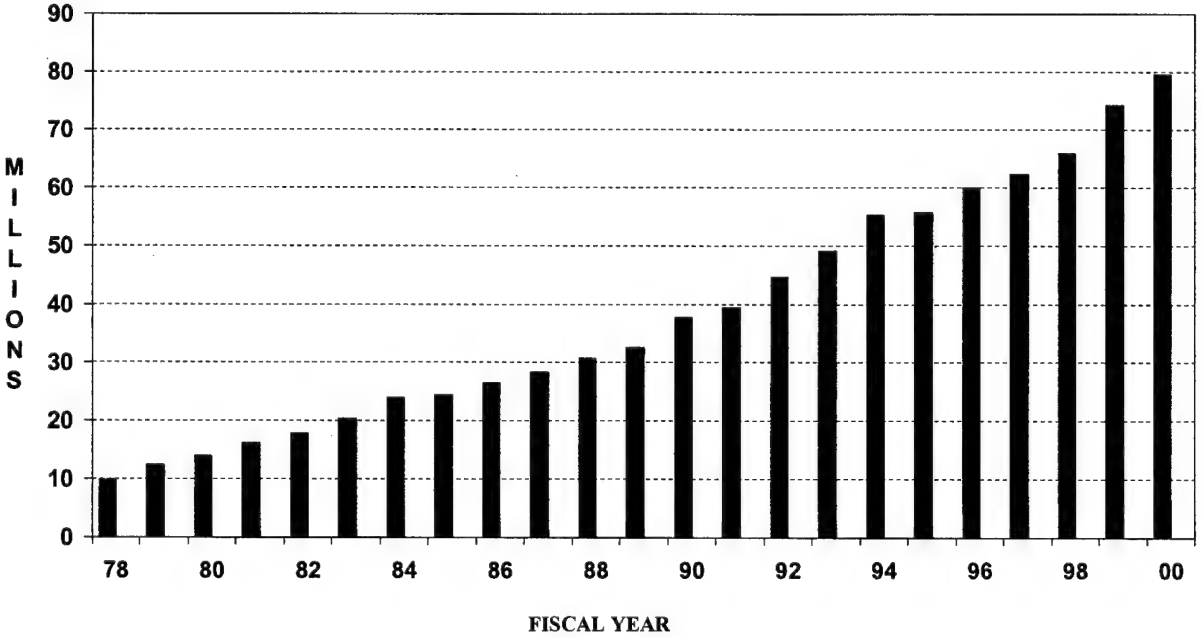
Total revenue passenger enplanements for the regional/commuter airlines, including Alaska and foreign territories, totaled 79.6 million in 2000 an increase of 7.1 percent over 1999. Form 41 carriers enplaned 44.7 million passengers (56.2 percent of the total) while Form 298-C carriers transported 34.8 million passengers.

U.S. REGIONALS/COMMUTERS TRAFFIC TRENDS

SCHEDULED REVENUE PASSENGER MILES



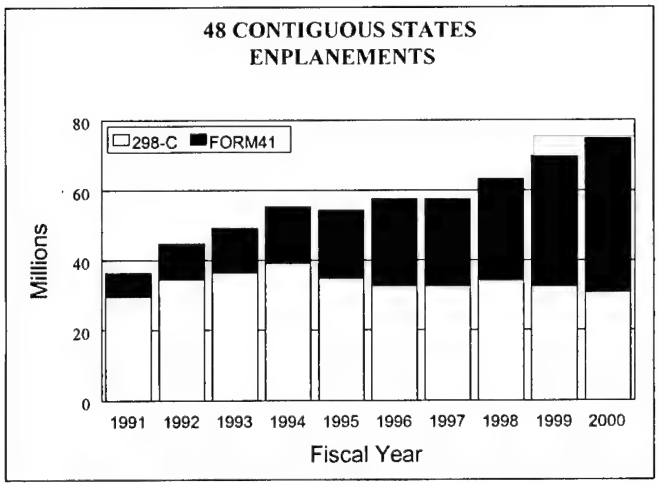
SCHEDULED PASSENGER ENPLANEMENTS



48 Contiguous States

For the 48 contiguous states, enplanements increased 7.3 percent in 2000, reaching 74.9 million. Form 298-C carriers enplaned 30.8 million passengers in 2000, a decrease of 5.5 percent over 1999. The nine carriers reporting on Form 41 enplaned 44.1 million passengers, an increase of 18.9 percent over 1999. The relatively high growth for the Form 41 carriers (and conversely, the negative rate of growth for Form 298-C carriers) is the result of Comair, one of the largest Form 298-C carriers in 1999, reporting on Form 41 during part of 2000.[2]

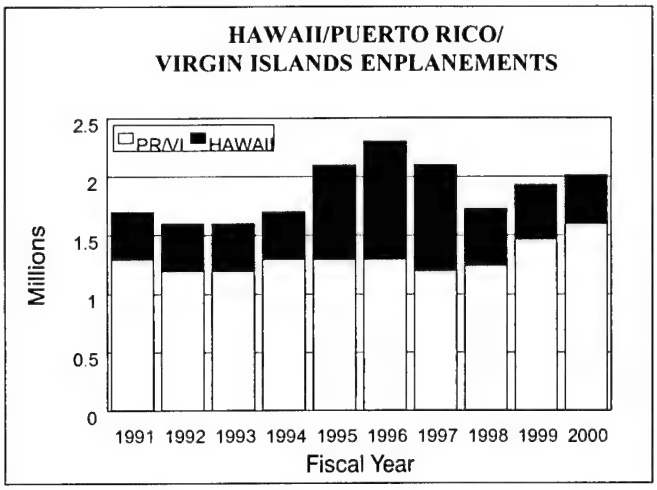
In 2000, Form 41 carriers accounted for 58.8 percent of all regional/commuter passengers enplaned in the 48 contiguous states compared to only 11.5 percent in 1990. Over this 10-year period, these carriers' enplanements have increased from 4.7 million to the current 40.1 million, an average annual increase of 23.9 percent. During this same 10-year period, Form 298-C carriers' passenger enplanements declined from 31.4 million to 30.8 million.



The significantly higher growth rate for the Form 41 carriers reflects a combination of two factors—more reporting carriers and higher growth by the reporting carriers relative to the rest of the industry. In 1990 only three regional carriers reported on Form 41 compared to nine today. However, these nine carriers' enplanements have grown at rates significantly higher than the industry as a whole. Since 1990, growth for the nine carriers have averaged 12.0 percent annually compared to 7.5 percent for the industry.

Hawaii/Puerto Rico/Virgin Islands

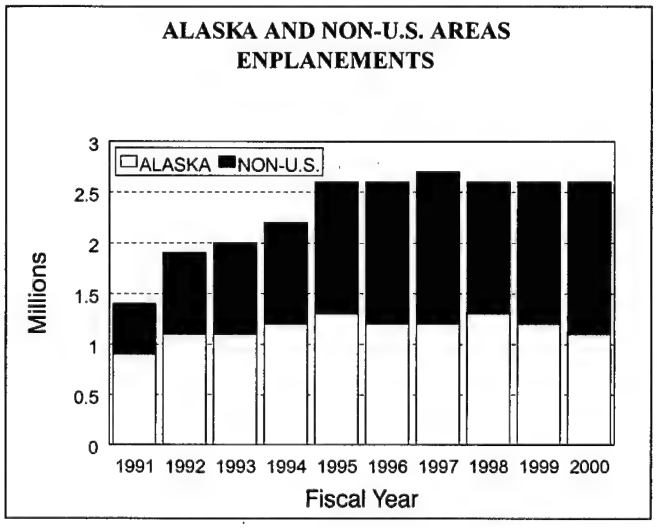
Enplanements in Hawaii, Puerto Rico, and the Virgin Islands totaled 2.0 million in 2000, an increase of 4.3 percent. The number of enplanements in Puerto Rico and the Virgin Islands increased 8.9 percent in 2000. Enplanements in Hawaii declined 10.6 percent in 2000, the fourth consecutive year of decline. This decline is due primarily to two carriers--Mahalo and Trans Air--going out of business during this time.



[2] Comair reported on Form 298-C from October 1999 to April 2000; on Form 41 from May to September, 2000.

Alaska/Non U.S. Areas

Enplanements in Alaska and non-U.S. areas totaled 2.6 million in 2000, unchanged from 1999. Alaskan enplanements decreased 8.3 percent, totaling just under 1.1 million. However, this was offset by the growth in U.S. regional/commuter enplanements in areas outside of the United States--1.5 million enplanements, up 7.1 percent. This growth was driven by an 18.5 percent increase in Canadian and Mexican transborder enplanements. Caribbean/Bahamas passenger enplanements were unchanged from 1999.



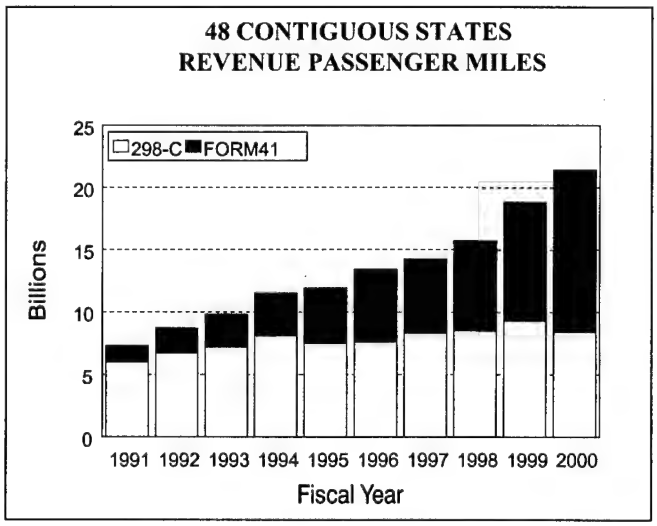
REVENUE PASSENGER MILES

In 2000, industry RPMs totaled just over 22.3 billion, an increase of 18.2 percent over 1999. Form 41 carriers reported 13.2 billion RPMs in 2000, accounting for 59.3 percent of the total. Form 298-C carriers reported 9.1 billion RPMs in 2000.

48 Contiguous States

Regional/commuter RPMs in the 48 contiguous states increased 18.6 percent in 2000, totaling just under 21.4 billion. The Form 41 carriers reported 13.0 billion RPMs in 2000, an increase of 36.8 percent. Form 298-C carriers reported 8.4 billion RPMs, a decrease of 10.0 percent.

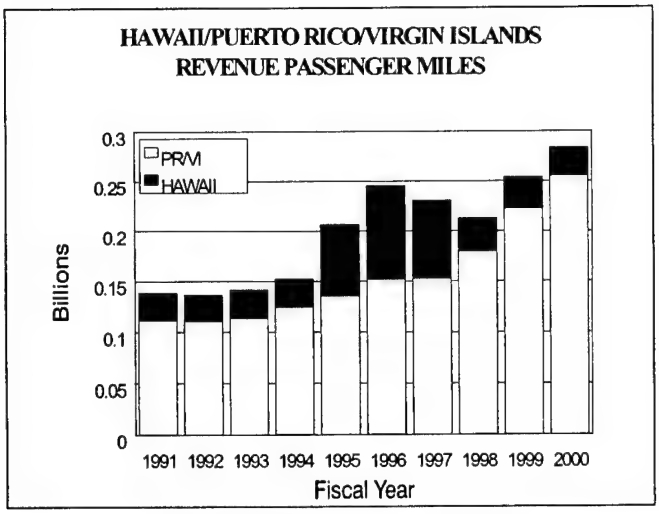
In 2000, the Form 41 carriers accounted for 60.7 percent of all RPMs in the 48 contiguous states, up from only 14.5 percent in 1990. Since 1990, these carriers' RPMs have increased from 1.0 to 13.0 billion, an average annual increase of 29.2 percent. The Form 298-C carrier RPMs increased by 3.8 percent annually during the same time period—from 5.8 to 8.4 billion. Again, the high growth rate for the Form 41 carriers is due to a combination of more carriers and rates of growth higher than the industry average.



Hawaii/Puerto Rico/Virgin Islands

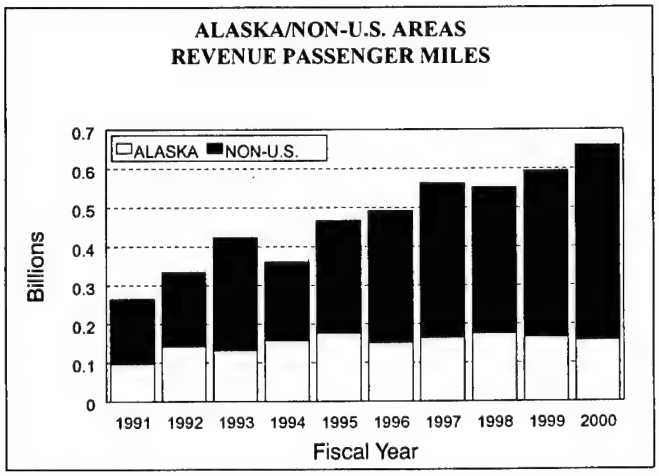
The combined RPMs of U.S. regional/commuter airlines operating in Hawaii, Puerto Rico, and the Virgin Islands totaled 284 million in 2000, an increase of 11.8 percent over 1999. RPMs in Puerto Rican and U.S. Virgin Islands markets

(255.9 million) were up 14.9 percent while Hawaiian markets' RPMs (27.8 million) decreased 10.0 percent in 2000.



Alaska/Non U.S. Areas

Regional/commuter RPMs in Alaska and other non-U.S. areas (Canada, Mexico and the Caribbean) totaled 658.0 million in 2000, an increase of 10.6 percent. Alaskan RPMs totaled 157.5 million (down 4.8 percent) while RPMs in the non-U.S. areas totaled 500.7 million (up 16.6 percent). The decrease in Alaskan RPMs is due largely to industry contraction and consolidation. The increase in non-U.S. areas is driven primarily by growth in Canadian and Mexican transborder (up 26.9 percent). Caribbean traffic declined 1.4 percent in 2000.



THE EVOLUTION OF A "NEW REGIONAL" INDUSTRY

The fundamental character of the regional/commuter industry has changed significantly since the mid-1980s. These changes include the relative size and sophistication of airline operations, the carriers involved (especially the dominant industry operators), the aircraft fleet mix, and the industry's relationship with the large commercial air carriers in the national air transportation system.

Three distinct, but interrelated, trends have provided the basis for the changing character and composition of the industry since the mid-1980s. They are (1) industry consolidation/integration, (2) industry concentration, and (3) the advent of the regional/commuter "jet age."

CONSOLIDATION AND INTEGRATION

The number of regional/commuter airlines has declined by almost two thirds since 1981, from 250 to only 90 carriers in 2000. The large decline in the number of carriers is largely the result of two factors. First, there is the dramatic growth in the number of code-sharing agreements with the major air carriers (see Table IV-1 for a current listing of code-sharing agreements). Second, is the wave of air carrier acquisitions of, or purchases of equity interest in, their regional/commuter code-sharing partners. These relationships with the larger air carriers resulted in the transferring of large numbers of low to medium density, short-haul jet routes to their regional partners. It is these relationships that have sustained the regional industry's historically high rate of growth over the past decade.

TABLE IV-1

AIR CARRIER/COMMUTER AIRLINES CODE-SHARING AGREEMENTS

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
1. Air Tran Florida Connection	Comair	Florida
2. Alaska Airlines	Horizon*	Boise Portland Seattle Spokane
	Trans States*	Los Angeles San Francisco
3. Aloha Airlines	Aloha Island Air	Honolulu
4. America West Express	Mesa	Columbus Phoenix
5. American Eagle	Executive Airlines* American Eagle*	San Juan Boston Miami New York Dallas/Ft. Worth Chicago Los Angeles
6. American Connection	Business Express	Boston
7. American Trans Air	Chicago Express	Chicago
8. Continental Express	Commutair Continental Express	Philadelphia Cleveland Houston Newark
	Gulfstream International	San Juan

AIR CARRIER/COMMUTER AIRLINES
CODE SHARING AGREEMENTS (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
9. Delta Connection	Atlantic Coast Jet	New York
	Atlantic Southeast*	Atlanta
		Dallas/Ft. Worth
		New York
		Florida
	SkyWest Airlines	Los Angeles
		Salt Lake City
10. Frontier Airlines	Mountain Air Express	Denver
11. Midwest Express	Astral Aviation	Milwaukee
12. Northwest Airlink	Business Express	Boston
	Express Airlines I	Memphis
	Horizon*	Portland
		Seattle
	Mesaba*	Detroit
		Minneapolis/St. Paul
	Trans States*	Los Angeles
13. Trans World Express	Chautauqua	St. Louis
	Gulfstream International	San Juan
	Trans States*	St. Louis
14. United Express	Atlantic Coast	Washington, D.C.
	Great Lakes	Chicago
		Denver
	Gulfstream International	Miami
		San Juan
	SkyWest Airlines	Las Vegas
		Los Angeles
		Phoenix
		San Francisco
	United Feeder Service*	Chicago

AIR CARRIER/COMMUTER AIRLINES
CODE SHARING AGREEMENTS (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
15. US Airways Express	Air Midwest	Kansas City
	Allegheny Commuter	Baltimore
		Pittsburgh
		Philadelphia
	CCAir	Charlotte
	Chautauqua	Orlando
		Pittsburgh
	Colgan	Boston
		New York
	Commutair	Boston
		New York
		Syracuse
	Mesa	Pittsburgh
		Tampa
	Piedmont Airlines	Baltimore
		Charlotte
		Florida
		Philadelphia
	PSA	Baltimore
		Indianapolis
	Trans States*	Los Angeles

*Carrier operates both large aircraft (over 60 seats), and commuter aircraft.

TABLE IV-2

TOP 50
REGIONAL/COMMUTER AIRLINES
RANKED BY TOTAL PASSENGER ENPLANEMENTS

FISCAL YEAR 2000

Carrier	Enplanements	Carrier	Enplanements
1. American Eagle	12,085,877	26. Astral	391,876
2. Comair	7,818,419	27. Aloha Island Air	390,912
3. Continental Express	7,621,394	28. Shuttle America	265,507
4. Mesaba	6,008,305	29. Chicago Express	232,576
5. Atlantic Southeast	5,986,069	30. Colgan Air	186,831
6. SkyWest	5,727,490	31. Peninsula	180,486
7. Horizon	5,056,439	32. United Feeder Service	144,335
8. Atlantic Coast	3,550,440	33. Big Sky	140,654
9. Piedmont	3,132,583	34. Corporate Express	116,614
10. Mesa	2,738,582	35. Freedom Air	90,111
11. Allegheny	2,446,967	36. Hagland Aviation	84,313
12. Trans States	2,044,987	37. Pacific Island Aviation	82,351
13. Executive Airlines	1,919,102	38. Samoa Air	72,835
14. PSA	1,135,508	39. Seaborne Aviation	65,496
15. Great Lakes	1,082,758	40. Grant Aviation	61,926
16. Express Airline I	1,076,630	41. Harbor Airlines	58,832
17. Chautauqua	1,069,487	42. Kenmore Air Harbor	55,614
18. Business Express	1,067,291	43. Bering Air	51,495
19. Gulfstream International	925,894	44. Viequies Air Link	50,998
20. Air Midwest	915,565	45. Cape Smythe	45,506
21. CCAir	758,815	46. Frontier Flying Service	44,338
22. Cape Air	590,544	47. Promech	39,060
23. Commutair	563,113	48. Chalks Flying Boat	38,180
24. Eagle Canyon	544,480	49. Taquan Air Service	35,121
25. ERA	432,549	50. Wings of Alaska	34,234

Source: DOT Form 298-C and Form 41

TABLE IV-3

TOP 20 CORPORATE STRUCTURES

Carrier/ Carrier Group	Percent of Industry Enplanements	Carrier/ Carrier Group	Percent of Industry Enplanements
1. Delta Connection	24.5	11. Chautauqua	1.3
2. American Eagle	18.9	12. Gulfstream International	1.2
3. Continental Express	9.6	13. Cape Air	0.7
4. Northwest Airlink	8.9	14. Commutair	0.7
5. US Airways Express	8.4	15. Eagle Canyon	0.7
6. Alaska	6.4	16. ERA Aviation	0.5
7. Mesa Air Group	5.6	17. Midwest Express	0.5
8. Atlantic Coast	4.5	18. Aloha Island Air	0.5
9. Trans States	2.6	19. Shuttle America	0.3
10. Great Lakes	1.4	20. Chicago Express	0.3

Source: DOT Form 298-C and Form 41

CONCENTRATION

Over time the number of regional carriers has been declining, and the size of the dominant industry carriers has been increasing. In 2000, the top 50 carriers accounted for approximately 99.6 percent of total industry enplanements. While total regional/commuter enplanements increased by 7.1 percent in 2000, the top 50 carriers grew by 10.0 percent. Within this group of carriers, the top five carriers alone accounted for almost half (49.7 percent) of industry enplanements and the top 10 carriers accounted for three-fourths (75.1 percent) of the total. (See Table IV-2 for the listing of the top 50 carriers in 2000.)

Although the relative ranking has changed, the composition of the group is basically unchanged from 1999. However, because of declining numbers of regional/commuter airlines, the list of the top 50 carriers does not truly reflect the level of industry consolidation and degree of integration with the larger air carriers.

Today a large number of regionals are owned, totally or in part, by their larger code-sharing partners, and still others are owned by other regionals. In 2000, a total of 15 regionals are owned, totally or in part, by eight of the larger commercial air carriers, and five more are owned by four other regionals.

A truer picture of the present composition of the regional/commuter airline industry is presented in Table IV-3. This table, which lists the top 20 corporate structures and their percentage share of 2000 industry enplanements, more accurately reflects the level industry consolidation and degree of integration with the larger air carriers. Enplanements for the top 20 regional/commuter corporate structures increased by 10.8 percent in 2000 and accounted for 97.6 percent of total industry enplanements.

The top five corporate groups accounted 70.4 percent of industry enplanements and the top 10 accounted for 90.8 percent.

THE REGIONAL/COMMUTER JET AGE

The introduction of the regional jet into the dynamics of the demand for air transportation services has significantly expanded the role and market presence of the regional/commuter industry. The phenomenal customer acceptance of the regional jet, coupled with the success operating carriers have experienced in markets where the aircraft is deployed, positions its operators to move beyond the current boundaries of traditional regional/commuter markets. The regional jets' range and speed opens up new opportunities for regional/ commuter carriers to serve longer-haul markets and also by-pass congested hub airports by providing point-to-point service.

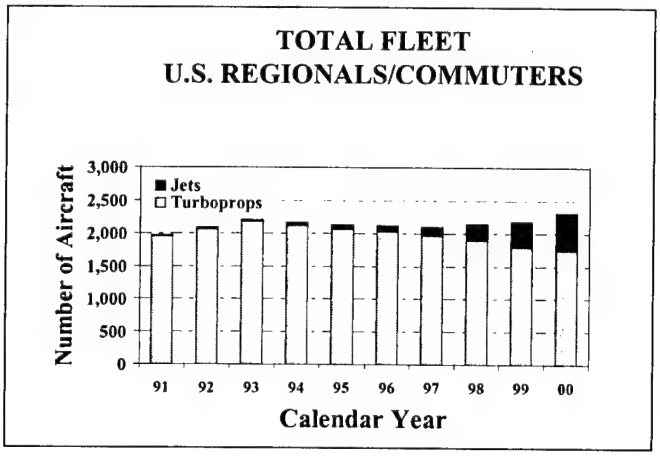
While jet aircraft have been operated by regional/commuter airlines for quite some time, the first true regional jet was introduced into service in 1993--four carriers operated jet aircraft in that year. Since 1993, four new regional jet aircraft models have been introduced into the market, ranging in size from 30 to 70 seats. Today, 15 regional/commuter airlines operate a total of 569 regional jet aircraft.

To assess the impact of the introduction and growing importance of the regional jet on the industry, regional/commuter schedules from the Official Airline Guide were analyzed for the 10-year period between 1991 and 2000. This analysis included fleet composition, activity and industry operational measures, airports and markets served, and the impact on the industry as a whole.

Fleet Composition

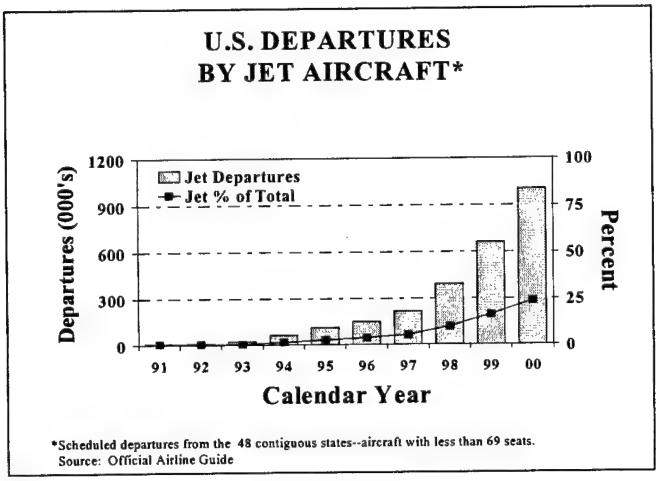
In 1991, three regional/commuter air carriers operated a total of 20 jets, consisting largely of the British Aerospace 146 and the Fokker F28. These aircraft accounted for only one percent of the total fleet, and just over 4.0 percent of seats offered for sale. By 1993, the year the regional jet was first introduced, four carriers operated a total of 29 jet aircraft. This relatively slow growth in the numbers of jet aircraft continued through 1996, totaling 90 in that year.

It was not until 1997 that the introduction of the regional jets started to accelerate, increasing by over 100 aircraft per year during the next 4 years. Between 1996 and 2000 the number of jet aircraft increased more than six-fold, from 90 aircraft in 1996 to 569 in 2000. The jet aircraft's share of the total regional/commuter fleet increased from 4.2 percent in 1996 to 24.6 percent in 2000. Additionally, jets accounted for just over one-third of regional carrier seats in 2000, up from only 6.7 percent in 1996.

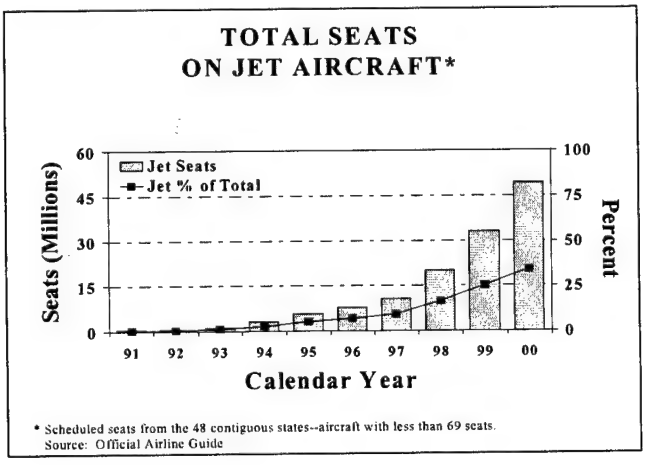


Activity and Operational Measures

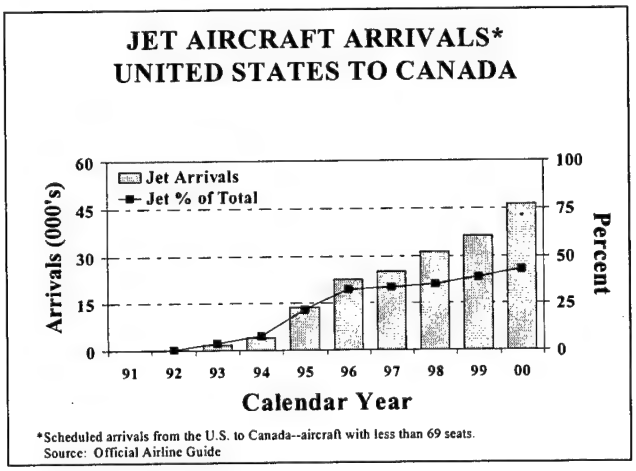
The number of jet departures by regionals/commuters has grown from just over 9.1 thousand in 1991 to well over 1.0 million in 2000. In 2000, jet departures by regionals/commuters accounted for 23.9 percent of total industry departures, up from just 0.2 percent in 1991. In 2000 alone, jet departures increased 51 percent, from 0.7 to over 1.0 million.



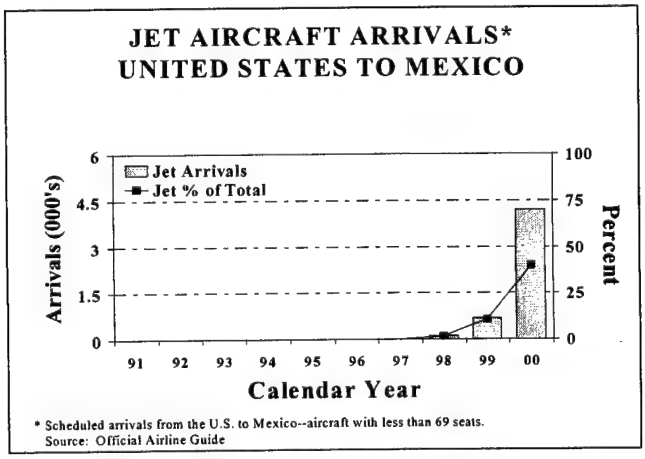
While jet aircraft accounts for nearly one-quarter of regional/commuter departures, jet aircraft accounted for over one-third (34.2 percent) of total regional/commuter seats in 2000. Seat capacity provided by commuter jet aircraft increased 48.9 percent from 1999, making an additional 16.2 million seats available to the travelling public.



Jet aircraft have also penetrated the transborder Canadian and Mexican markets. Service into Canada began in 1992 with a total of 154 jet flights from the United States--0.3 percent of all regional/commuter flights between these two points. In 2000, over 46,300 flights from the United States to Canada were flown by jets—almost 43 percent of all regional/commuter flights. These 46,300 flights provided 2.3 million seats, over 56 percent of regional/commuter seat capacity between the United States and Canada.

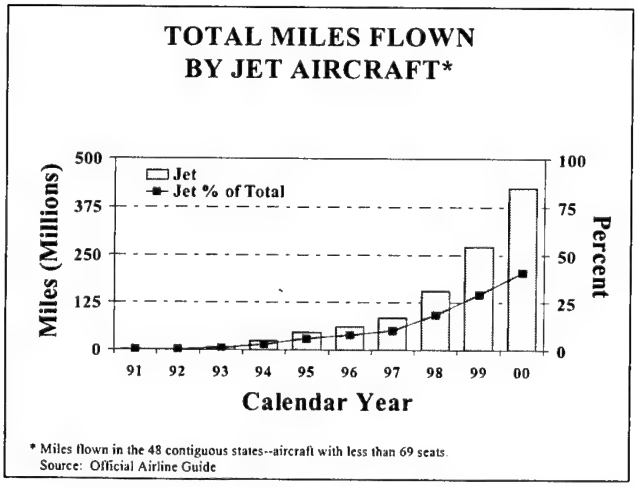


The newest international market for regional/commuter jet aircraft departing from the United States is Mexico. Prior to 1998, regional/commuter service between Mexico and the United States was flown entirely by propeller and turboprop aircraft. In 1998, regional jets were introduced into the U.S.-Mexico market, with departures totaling 113 in that year.

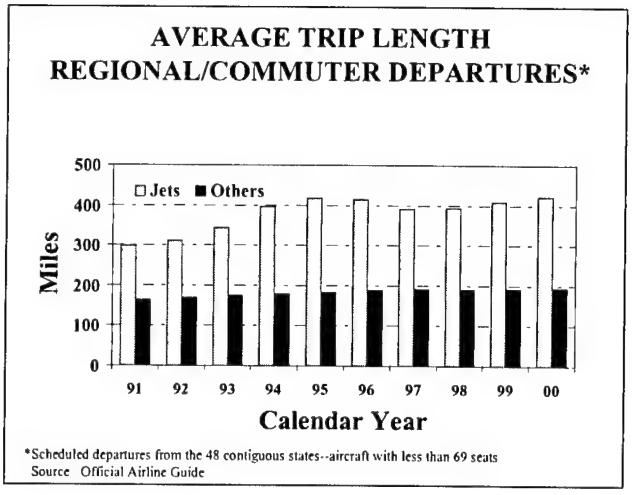


In 2000, only 2 years after the introduction of jet service, regional/commuter carriers flew over 4,200 jet flights to Mexico from the United States--almost 40.0 percent of all regional/commuter flights in these markets. In addition, during 2000, jet seat capacity increased by 173,828 seats. At the end of 2000, over 60.2 percent of regional/commuter seat capacity between the United States and Mexico was supplied by jet aircraft.

With their higher cruise speed and long range capabilities, the miles flown by jet aircraft are also increasing rapidly, from just 0.4 percent of total industry miles flown in 1991 to 40.7 percent in 2000. Between year-end 1999 and 2000, the miles flown by jet aircraft increased 56.2 percent.



The growth in miles flown is indicative of the fact that the regional jets are being operated on routes significantly longer, on average, than traditional regional/commuter routes. Since 1994, following the introduction of the 50-seat Bombardier regional jet, the average trip length flown by regional jets has generally exceeded 400 miles. By comparison, the average trip length for all other regional/commuter aircraft departing from the U.S. has remained at around 200 miles.

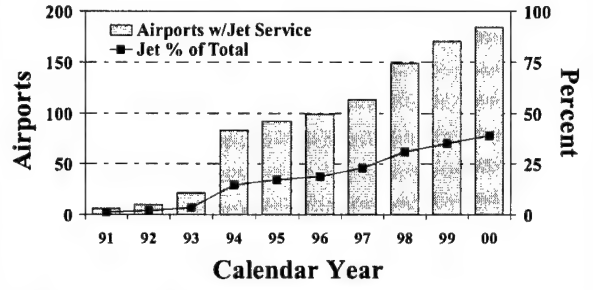


Markets/Routes Served

The new regional jets are providing the flying public with significantly more travel options to choose from in making their travel plans. With the addition of the Bombardier, Embraer, and Fairchild-Dornier regional jets, more small- and medium-sized hubs are being served by regional jets. Consequentially, the number of airports and city-pairs benefiting from jet service are at an all-time high.

The number of U.S. airports receiving regional/commuter jet service increased from a total of only six in 1991 to 184 in 2000. During 2000, the number of U.S. airports receiving regional jet service increased by 14 airports. The percentage of airports receiving regional jet service is also on the rise. In 1991, only 1.1 percent of the airports served by regional/commuter aircraft had jet service. In 2000, 38.7 percent of all airports served by regional/commuter carriers received jet service. At present, Hawaii and Alaska do not have airports offering regional jet service.

U.S. AIRPORTS SERVED BY JET AIRCRAFT*

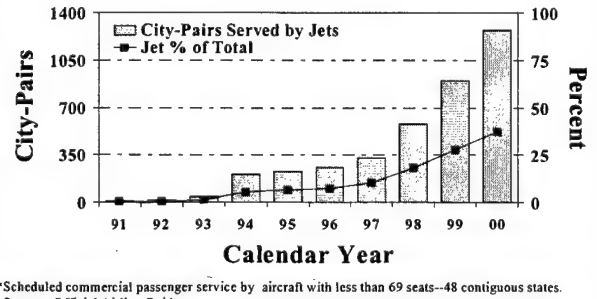


*Scheduled commercial passenger service by aircraft with less than 69 seats--48 contiguous states.
Source: Official Airline Guide

Travelers between points in the United States and Canada and Mexico are also witnessing an increase in the numbers of airports served by jet aircraft. In 2000, regional/commuter jet aircraft flew to nine Canadian airports from the United States, up from just two airports in 1992. In Mexico, 13 of the 15 airports with regional/commuter service are served by jet aircraft; up from only one airport in 1998.

Correlating to the increase in airports with commuter jet service is the increase in the number of city-pairs served by jet aircraft. Regional/commuter city-pairs with jet service grew from 10 in 1991 to 1,270 in 2000. In the year 2000 alone, an additional 369 city-pairs received regional/commuter jet service, raising the percentage of total regional/commuter city-pairs with jet service to over 37 percent.

CITY-PAIRS SERVED BY JET AIRCRAFT*



*Scheduled commercial passenger service by aircraft with less than 69 seats--48 contiguous states.
Source: Official Airline Guide

Out of the 1,270 city-pairs served by regional jets in the year 2000, 62 were flown in international transborder service. Between the United States and Canada, 46 of 97 regional/commuter city-pairs were served by jets. Between the U.S. and Mexico, 16 of the 26 regional/commuter city-pairs received jet service.

Top 10 Regional/Commuter Airports

The top ranked airport in 2000, as measured by regional jet departures, was Cincinnati/Northern Kentucky International (CVG), the main hub for Comair. Scheduled jet departures at CVG totaled 112,548 in 2000, 90.4 percent of all regional/commuter departures and 55.4 percent of all commercial departures at the airport.

Chicago O'Hare ranked a distant second to CVG in 2000, with a total of 69,404 jet departures in 2000. Cleveland Hopkins (38,802), Atlanta Hartsfield (38,382), and Washington Dulles (32,504) round out the list of the top five airports with scheduled jet service from regional/commuter carriers.

Regional jet departures at the top 10 ranked regional/commuter airports accounted for 48.7 percent of total regional/commuter departures and 17.2 percent of total commercial departures at these 10 airports. In the 48 contiguous states, commuter jet departures accounted for 23.9 percent of all regional/commuter departures, and 9.5 percent of all commercial departures.

TABLE IV-4

TOP 10 AIRPORTS
RANKED BY COMMUTER JET DEPARTURES
CALENDAR YEAR 2000

			Departures			Commuter Jet Departures As A % Of Total	
			Commuter*			Commuter	Commercial
ID		Airport	Jet Only	Total	Commercial **	Departures	Departures
1.	CVG	Cincinnati/N. Kentucky Int'l.	112,548	124,501	203,197	90.4	55.4
2.	ORD	Chicago O'Hare Int'l.	69,404	103,183	433,515	67.3	16.0
3.	CLE	Cleveland-Hopkins Int'l.	38,802	85,558	143,564	45.4	27.0
4.	ATL	William B. Hartsfield Int'l.	38,382	91,791	424,566	41.8	9.0
5.	IAD	Washington Dulles Int'l.	32,504	121,303	193,123	26.8	16.8
6.	IAH	Houston Intercontinental	31,605	68,845	215,630	45.9	14.7
7.	LGA	New York La Guardia	31,757	66,283	199,565	47.9	15.9
8.	RDU	Raleigh-Durham Int'l.	31,212	51,505	101,058	60.6	30.9
9.	DFW	Dallas/Fort Worth Int'l.	23,494	123,689	395,792	19.0	5.9
10.	EWR	Newark Int'l.	21,189	48,598	192,550	43.3	11.0
		Departures - Top 10	430,897	885,616	2,502,560	48.7	17.2
		Total Departures - 48 U.S.	1,004,606	4,208,797	10,553,544	23.9	9.5

Source: Official Airline Guide
* Scheduled Commercial Passenger Aircraft with seat size >=3 and <69.
**Scheduled Commercial Passenger Aircraft with seat size >= 3.

Industry Impact

The regional/commuter segment of air transportation has distinguished itself as a "high-flying" member of the commercial aviation industry. The past several years have seen rapid development of routes utilizing regional jets, much to the increasing satisfaction of the travelling public. However, even with the high traffic growth being experienced by the industry, there are some down sides as the regional/commuter carriers move toward a fleet composed of greater numbers of jet aircraft.

In 1991, a total of 3,475 city-pairs received regional/commuter service. By the end of 2000, regional/commuter carriers still served a total of 3,424 city-pairs, only 51 less than served 10 years earlier. However, of the 3,475 city-pairs served in 1991, only 1,811 (52.1 percent) received regional/commuter in 2000. While another 156 of the city-pairs received replacement service from large air carriers, the fact remains that 1,508 city-pairs no longer receive air carrier service of any kind.

FORECAST ASSUMPTIONS

Industry growth is expected to continue to outpace that of the larger commercial air carriers, and to be driven, in large part, by the increased demand for aviation services. The increasing number of new state-of-the-art

aircraft, especially large high-speed turboprops and regional jets with ranges of up to 1,000 miles, is creating new opportunities for growth in nontraditional regional/commuter markets. However, the primary role of the regional industry will remain that of feeding traffic to the major and national carriers, even as they expand into new markets with longer route segments.

The regional airline industry is expected to continue to benefit from the continuing integration of service with the larger commercial air carriers, and further route rationalization by its larger partners. The continuing need of the larger commercial air carriers to reduce overall costs and fleet size, insures that these carriers will continue to transfer its smaller, marginally profitable markets to their regional partners. In fact, the increased use of regional jets is expected to lead to another round of route rationalization by the large commercial carriers, including low- to medium-density markets in the 500-mile range and beyond. Regional jets can serve these markets with the speed and comfort of a large jet and, at the same time, offer greater service frequency than would be economically feasible with larger jet aircraft. This is expected to be one of the major drivers of growth during the early years of the forecast period.

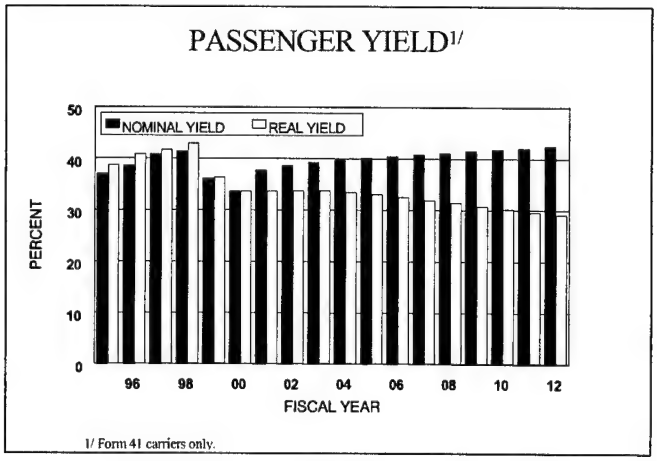
While the transfer of selected routes is expected to accelerate during the early years of the forecast period, this phenomenon should diminish considerably during the mid to latter years of the forecast period. Consequently, the rate of growth in enplanements will be lower than that experienced in the past. Also contributing to the slower growth in passenger traffic is the fact that the large commercial carriers are operating at historically high load factors and this tends to diminish the value of additional feeder traffic. As long as the larger air carriers continue to operate at load factors of 70.0 percent or higher, they may be unable to handle larger volumes of feeder traffic from their regional partners.

RPMs are expected to increase at a faster rate han enplanements. This is due to the fact that the regional/commuter airlines will be acquiring large numbers of jet aircraft with significantly longer-range capabilities. This will open up longer-haul markets for the regional/commuter operators. Although the average passenger trip length is expected to increase significantly during the forecast period, the regional/commuter carriers will continue to serve primarily shorter-haul markets. The emphasis will be on improved service quality and schedule frequency in markets best suited to their operations.

The baseline assumptions for passenger yield, average aircraft seat size, passenger trip length, and load factor are presented in tabular form in Chapter X, Table 23.

PASSENGER YIELD

The nominal passenger yield for the nine Form 41 regional/commuter air carriers was 33.75 cents in 2000, down 6.9 percent from 1999 and 18.6 percent lower than in 1998. This decline can be attributed largely to the increased utilization of regional jets operating at higher load factors and flying longer passenger trip lengths. Even with these declines, the Form 41 regional/commuter carriers' yield is still almost two and one half times higher than that of the larger air carriers (14.35 cents in 2000).

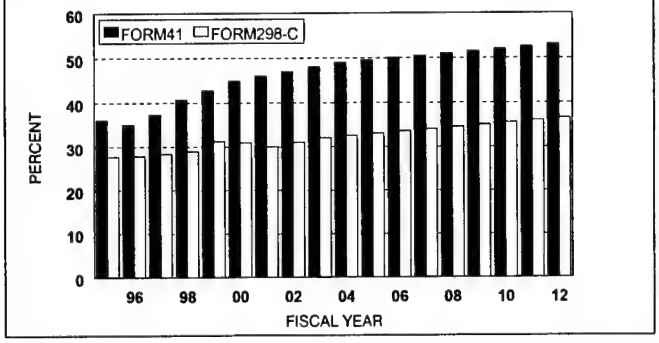


The nominal yield is expected to increase throughout the forecast period (up 1.2 percent annually), from 33.75 cents in 2000 to 39.05 cents in 2012. The real yield is projected to remain steady during the first years of the forecast period, then decline thereafter and reach 28.35 cents in 2012. This represents a average annual decline of 1.4 percent over the 12-year forecast period.

AVERAGE AIRCRAFT SIZE

The most significant change in fleet composition will result from the integration of large numbers of regional jet aircraft into the fleet, most of which occur in the "41 to 60 seat" category. These aircraft will contribute to increase public acceptance of regional airline service, and will offer the greatest potential for replacement service on selected jet routes.

AVERAGE SEATS PER AIRCRAFT



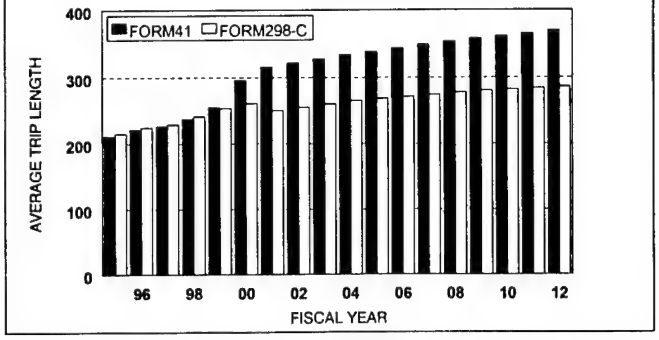
The regional/commuter aircraft fleet will continue to grow rapidly during the forecast period. As such, the average seats per aircraft (calculated by dividing available seat miles by miles flown) is expected to increase by 0.7 seats annually over the 12-year forecast period, from 37.5 seats in 2000 to 46.0 seats in 2012.

Most of the growth in seat size is expected to come from those carriers operating the larger turboprop and regional jets. The average aircraft size of the Form 41 carriers is projected to increase from 44.9 seats in 2000 to 53.0 seats in 2012. The average aircraft size for the Form 298-C carriers is expected to grow from 30.9 seats in 2000 to 36.5 seats in 2012.

PASSENGER TRIP LENGTH

The growth in the average passenger trip length, and the resultant higher growth in RPMs relative to enplanements, will be driven, in large part, by the increased numbers of larger regional jets and high-speed turboprops entering the regional/commuter carrier fleet during the forecast period. With increased speed and capacity, these aircraft will serve expanded market areas on a timely and efficient basis. The average trip length is projected to increase from 280.4 miles in 2000 to 338.8 miles in 2012, an increase of just under 4.9 miles annually.

AVERAGE TRIP LENGTH



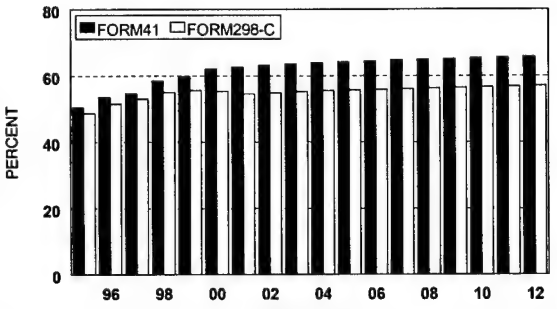
The trip length for the Form 41 carriers is forecast to increase from 295.6 miles in 2000 to 369.0 miles in 2012. For Form 298-C carriers, the trip length is expected to increase from 260.9 miles in 2000 to 286.0 miles in 2012.

PASSENGER LOAD FACTOR

With the introduction of larger jet aircraft into the regional fleet, the industry load factor is

expected to rise slowly over the 12-year forecast period. The average regional/commuter industry load factor is expected to increase from 59.0 percent in 2000 to 62.8 percent in 2012. It is also assumed the regional/commuter industry will continue to emphasize frequency of service and this should keep the regional/commuter load factors from reaching the level of the major airlines.

LOAD FACTORS



The load factor for Form 41 carriers is projected to increase from 62.0 percent in 2000 to 65.7 percent in 2012. The load factor for the Form 298-C carriers increases from 55.2 percent to 57.0 percent over the same time period.

REGIONALS/COMMUTERS FORECASTS

There has been an accelerated decline in the number of 19-seat aircraft as regional/commuter carriers move to larger, more productive sized aircraft. At this point in time, the one negative aspect of the move to larger regional jets is that an increasing number of smaller communities have lost scheduled air service. This is because they cannot be served profitably by the regional/commuter airlines using aircraft with more than 19 seats; and passenger demand at these locations cannot support service with larger aircraft.

Regional/commuter forecasts of enplanements, Available Seat Miles (ASMs), RPMs, fleet, and hours flown are presented in tabular form in Chapter X, Tables 24 - 26.

REVENUE PASSENGER ENPLANEMENTS

Regional/commuter passenger enplanements are projected to increase by 7.4 percent in 2001 (to 85.5 million), and then grow at slower rates over the remainder of the forecast period. Passenger enplanements are expected to increase at an average annual rate of 5.6 percent during the 12 -year forecast period, and reach a total of 153.7 million in 2012.

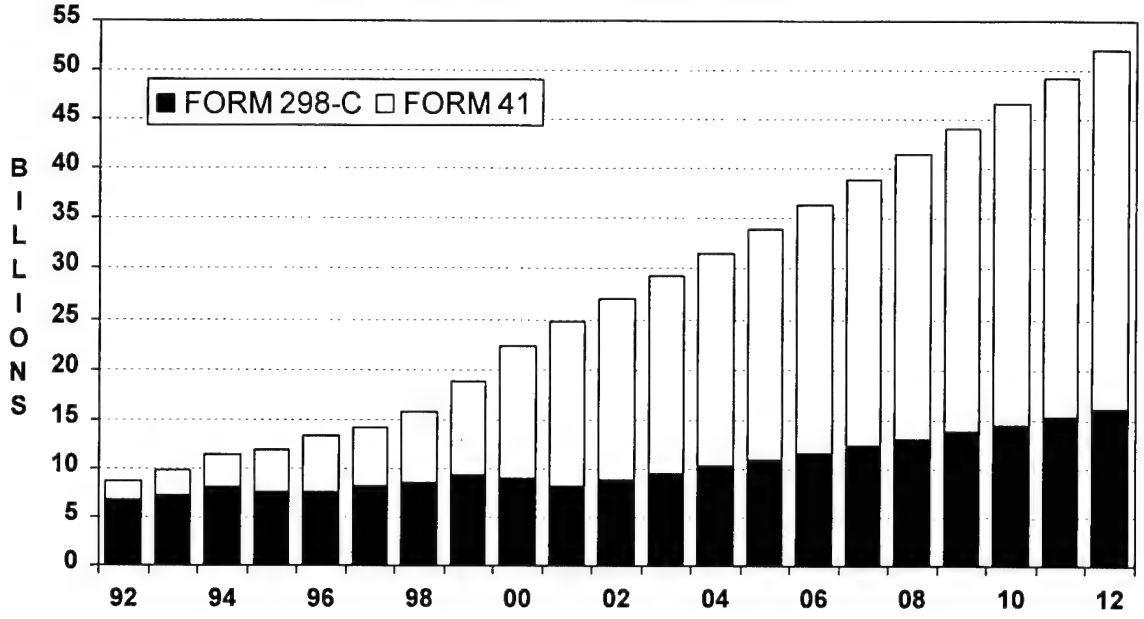
Form 41 carrier enplanements are projected to increase 18.0 percent (to 52.8 million) in 2001, and then slow to an average annual growth of 6.1 percent over the next 6 years. Over the entire forecast period, enplanements for this group of carriers are forecast to increase at 6.7 percent annually, totaling 97.8 million in 2012.

Form 298-C carrier passenger enplanements are projected to decline 6.2 percent in 2001, due to the fact that all of Comair's traffic is reported with Form 41 carriers beginning in 2001.[3] Form 298-C carriers RPMs are projected to total 34.6 million (up 5.8 percent) in 2002 and then increase at an average annual rate of 4.9 percent over the final 10 years of the forecast period, totaling 56.0 million in 2012.

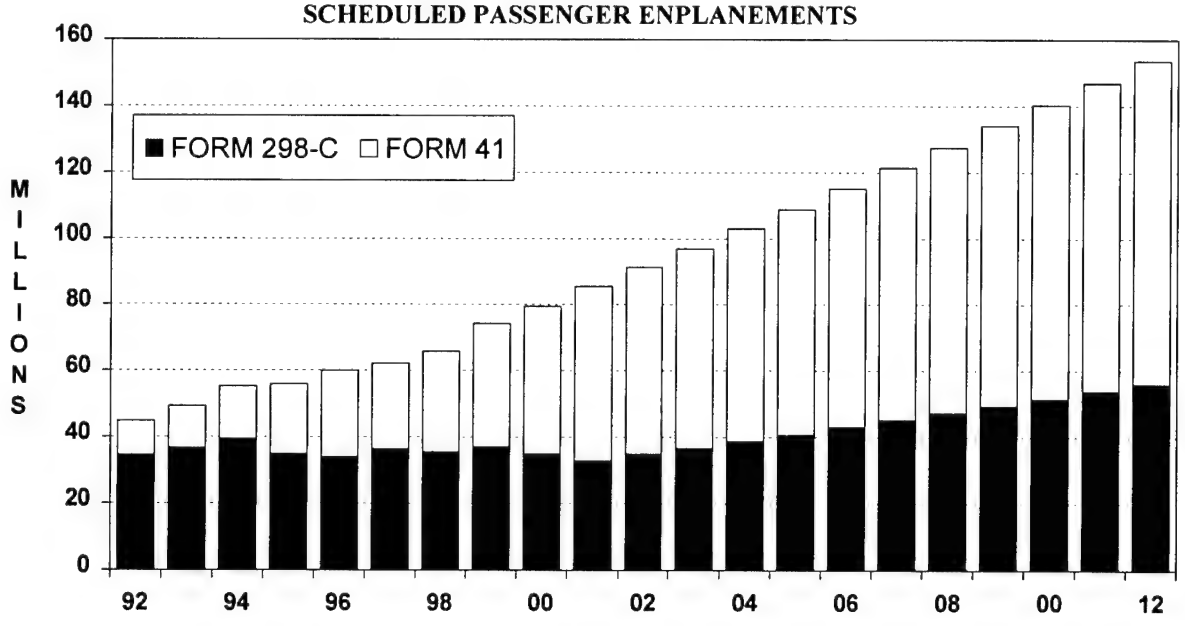
[3] Comair's enplanements and RPMs included in the 298-C carrier data base includes 7 months of fiscal year 2000 (October 1999 to April 2000).

U.S. REGIONALS/COMMUTERS FORECASTS

SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



REVENUE PASSENGER MILES

Regional/commuter RPMs are expected to total 24.8 million (up 11.2 percent) in 2001, then slow to an average growth of 8.0 percent over the next 5 years. RPMs are forecast to increase at an average annual rate of 7.3 percent over the 12-year forecast period, and total 52.1 billion in 2012.

Passenger miles for the Form 41 carriers are forecast to increase 25.8 percent (to 16.6 billion) in 2001 and 9.0 percent in 2002 (to 18.1 billion). During the 12-year forecast period, RPMs are expected to increase at an annual rate of 8.7 percent, totaling 36.1 billion in 2012.

Passenger miles for the Form 298-C carriers are projected to decline to 8.2 billion (down 10.1 percent) in 2001 and then increase to 8.8 billion (up 7.9 percent) in 2002. During the final 10 years of the forecast period, these carriers' RPMs are expected to grow at an average annual rate of 6.1 percent and total 16.0 billion in 2012.

REGIONALS/COMMUTERS PASSENGER FLEET

The current composition of the regional/ commuter fleet underscores the growth of the industry and quality of service provided. From a fleet once composed predominantly of general aviation aircraft, today's fleet is increasingly composed of new state-of-the-art turboprops and regional jets offering amenities similar to those found on larger jet aircraft. Today's regional/commuter airlines have a large variety of aircraft from which to choose. As such, regional/commuter carriers are able to tailor their fleet to the specific markets they serve.

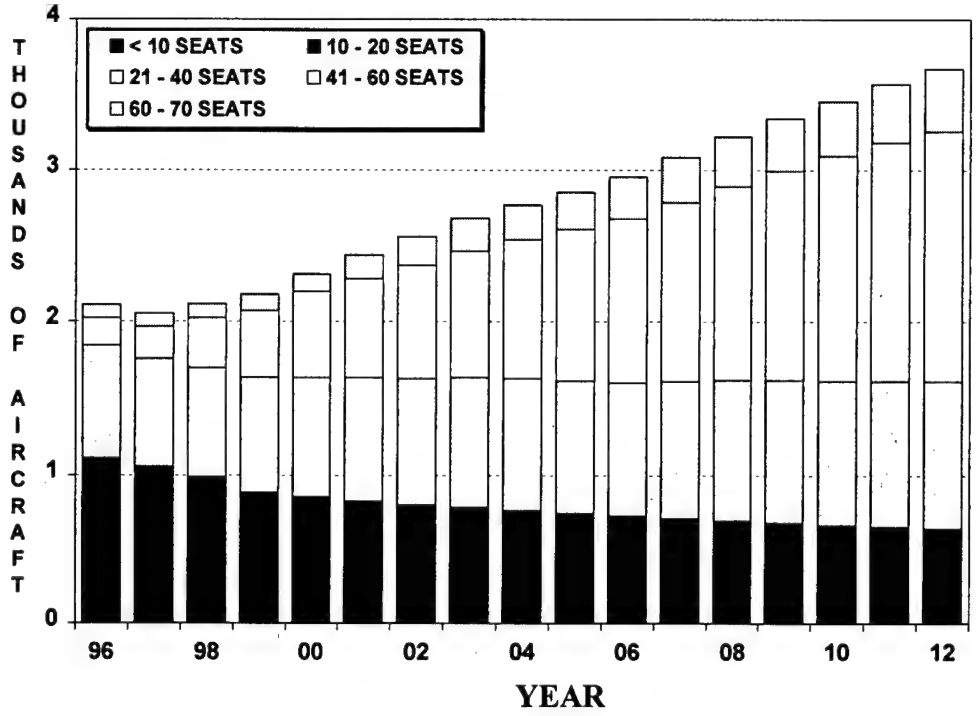
The regional/commuter aircraft seat categories were changed last year to more accurately reflect the changing nature of this fast growing industry. More specifically, the changes made were intended to include categories which cover the three seating configurations of regional jets that are projected to enter the regional fleet over the forecast period--32, 50, and 70 seats--as well as eliminate categories for which relevant aircraft no longer exist.

The regional/commuter passenger fleet is projected to grow at an average annual rate of 3.9 percent, increasing from 2,312 aircraft in 2000 to 3,673 aircraft in 2012. The growth in the regional/commuter fleet is considerably less than that forecast for passenger demand (5.6 percent annually), and reflects the increased efficiencies which result from the use of larger aircraft and the achievement of higher load factors. The average seat size of the regional/ commuter fleet is expected to increase from 37.5 seats in 2000 to 46.0 seats in 2012. The average load factor is projected to increase from 59.0 percent in 2000 to 62.8 percent in 2012.

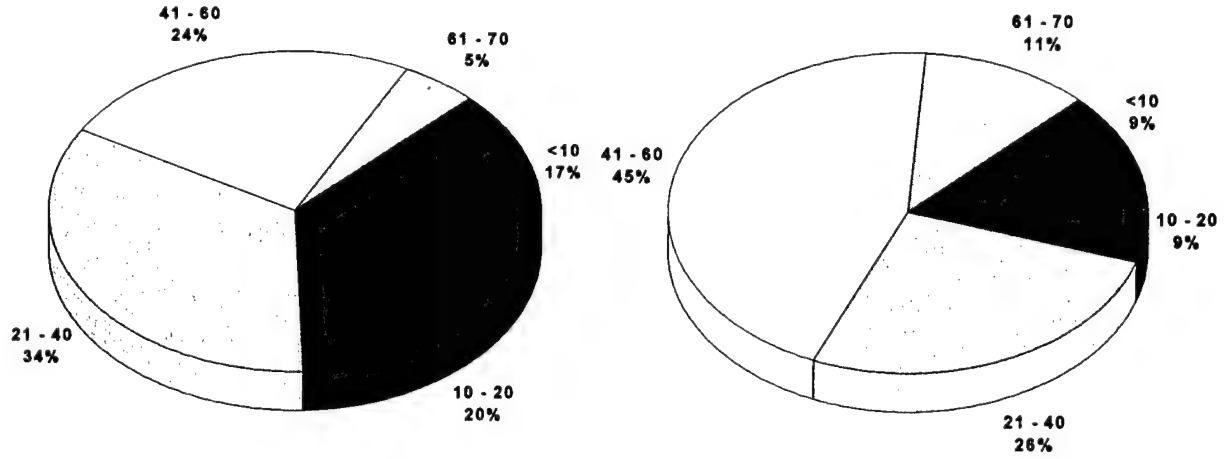
Changes in the regional/commuter airline industry are being defined by the changes taking place in the composition of the regional/ commuter aircraft fleet. The introduction of regional jet aircraft will accelerate greatly during the forecast period. By the year 2012, it is projected that more than 1,600 new regional jet aircraft, ranging in size from 32 to 70 seats, will be added to the fleet. While the overall average annual growth in the regional fleet is expected to be 3.9 percent, the number of regional jets will grow at an average annual rate of 11.9 percent. Regional jets account for 24.6 percent of the fleet today. By 2012, it is forecast that they will account for almost 60 percent of the fleet.

Most of the aircraft in the "less than 10 seats" category are operated by Alaskan regional carriers. Regional aircraft in this category once made up the bulk of the fleet--60.9 percent in 1980. In 2000, this category totaled 400 aircraft and accounted for only about one-fifth of the total regional fleet. Between 2000 and 2012, the

U.S. REGIONALS/COMMUTERS PASSENGER AIRCRAFT



PERCENT BY AIRCRAFT TYPE



2000 2012

number of aircraft in this category is expected to decline to 314 aircraft, and account for only 8.5 percent of the total fleet in 2012. It is assumed that the decline in this category will occur almost entirely among regional airlines operating within the 48 contiguous states.

In 2000, the "10 to 20 seats" category, which made up the largest portion of the fleet during the early to mid 1990s, continued to decline. In 2000, aircraft in this category totaled 452 (down 3.6 percent from 1999) and accounted for only 19.6 percent of the total fleet. The recent decline in this group is expected to continue throughout the current forecast period. It is projected that the "10 to 20 seats" aircraft category will decline to 328 in 2012, and account for only 8.9 percent of the fleet in that year.

The greatest growth in the regional/commuter fleet is expected to occur from aircraft having between 21 and 70 seats. This is due to the continued substitution of service and new route opportunities created through the use of larger, longer-range regional aircraft. It is projected that almost 2,200 regional jets (with up to 70 seats) will be in operation by the end of the forecast period, compared to an estimated 569 aircraft in 2000. By 2012, it is estimated that 12.4 percent of the regional jets will be in the "21 to 40 seats" category, 71.1 percent in the "41 to 60 seats" group, and 16.5 percent in the "61 to 70 seats" category.

In 2000, aircraft in the "21 to 40 seats" category accounted for 34.0 percent of the regional fleet, the "41 to 60 seats" category[4] made up 24.2 percent, and aircraft with "61 to 70 seats"[5] accounted for only 5.0 percent. However, it is the growth in the "41 to 60 seats" category that will be most dramatic over the forecast period. The bulk of the regional jets that will be introduced into the fleet will fall in this category.

By the year 2012, these three aircraft categories are expected to account for a combined 82.5 percent of the total fleet--26.5 percent in the "21 to 40 seats" category, 44.6 percent in the "41 to 60 seats" group and 11.4 percent in the "61 to 70 seats" category. During the 12-year forecast period, aircraft having 21 to 40 seats are forecast to increase from 785 to 972, an average annual increase of 1.8 percent. The number of aircraft in the "41 to 60 seats" category is projected to increase from 559 to 1,639, up 9.4 percent on an annual basis. During the same time frame aircraft in "61 to 70 seats" category are expected to increase from 116 in 2000 to 420 in 2012, an average annual growth of 11.3 percent.

FLIGHT HOURS

Regional/commuter flight hours, as reported on DOT Form 298-C and on Form 41, totaled 3.8 million hours in 2000, up 2.3 percent compared to 1999. During the forecast period industry flight hours are expected to increase to 4.0 million (up 4.7 percent) in 2001 and to just under 4.2 million (up 4.4 percent) in 2002. During the 12-year forecast period, flight hours are forecast to increase at an average annual rate of 4.6 percent, totaling just over 6.5 million hours in 2012.

[4] This category of aircraft includes the regional jet aircraft operated by Air Wisconsin and Midway Airlines.

[5] This category of aircraft includes the Avro 85s operated by Mesaba and the F-28 aircraft operated by Horizon.

CHAPTER V

GENERAL AVIATION

CHAPTER V

GENERAL AVIATION

The term "general aviation" is used to describe a diverse range of aviation activities and includes all segments of the aviation industry except commercial air carriers (including commuter/ regional airlines) and military. Its activities include the training of new pilots, sightseeing, the movement of large heavy loads by helicopter, and flying for corporate/business or personal reasons. Its aircraft range from a one-seat single-engine piston to the long-range corporate jet.

General aviation is an important component of both the aviation industry and our national economy. It provides on-the-spot efficient and direct aviation services to many medium and small sized communities that commercial aviation cannot or will not provide. In addition, the production and sale of general aviation aircraft, avionics, and other equipment, along with the provision of support services such as flight schools, fixed base operators, finance, and insurance, make the general aviation industry an important contributor to the nation's economy.

According to a recent study[1], the industry's contributions to the U.S. economy in 1998 were as follows:

- General aviation-related economic activity totals $64.5 billion annually.
- General aviation and related activity employs 638,000 people who earn $19.9 billion.
- General aviation accounts for 6.6 percent of aviation's total contribution ($976 billion) to the U.S. economy.

REVIEW OF 1999-2000

It has been 6 years since the passage of the General Aviation Revitalization Act of 1994 (GARA) and all indications are that the Act is accomplishing its purpose. The industry, hurt by rising product liability costs, had gone from producing a high of almost 18,000 aircraft in 1978 down to only 928 aircraft in 1994. The decline in production also resulted in the loss of 100,000 jobs in the industry.

With 6 years worth of data compiled, the success of GARA can be measured. Resurgence of the industry is evidenced by increasing general aviation activity at FAA air traffic facilities, an increasing active fleet, and record

[1] *The Economic Impact of Civil Aviation on the U.S. Economy – 2000*, Wilber Smith Associates

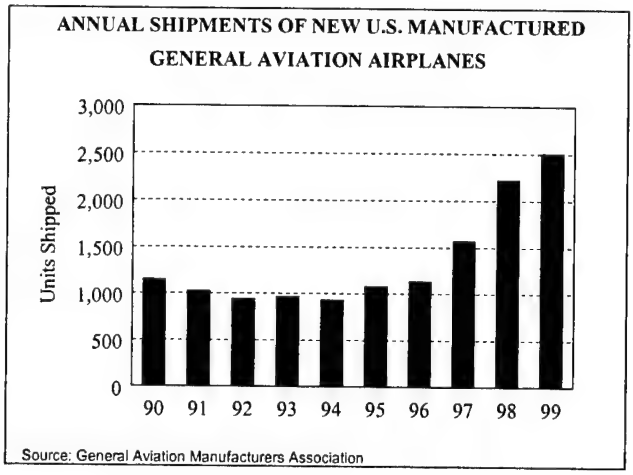
shipments and billings of fixed-wing general aviation aircraft. While the past several years have seen a resurgence for general aviation products and services, it appears that the immediate future shows promise as well. However, the recent large increases in the price of aviation fuels may be having an effect on the activity of the general aviation fleet. This is evidenced by the fact that general aviation activity at combined FAA/contract towers and en route centers declined slightly in 2000.

Promise in the future is evidenced by the industry's actions to stimulate the development and production of new general aviation products and services. New manufacturing facilities are being built and old facilities are being expanded. Sales of general aviation aircraft are setting new records for value of aircraft shipped. Much of this record sales value is for aircraft at the higher priced end of the general aviation fleet--turbine powered aircraft--and is likely due in part to the increase in fractional ownership. Dollars spent on research and development are advancing avionics and computer technology; advances that are not only expected to increase aviation safety, but are expected to make easier to learn how to fly. Of course, without pilots to fly the planes there would be no industry. To stimulate growth in the pilot population, the industry is promoting flying with "learn to fly" programs. The industry is also developing programs to assist schoolteachers in bringing aviation into the classroom with the hope of encouraging students to pursue careers in the field of aviation.

What follows is a review of the industry's performance during 1999 and 2000. For the most part, results for this period have been positive. These positive results are the foundation on which the industry can plan and build for the foreseeable future.

AIRCRAFT SHIPMENTS AND BILLINGS

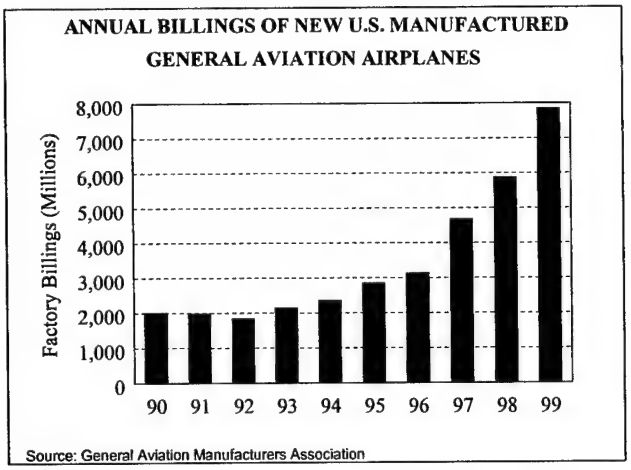
According to statistics released by the General Aviation Manufacturers Association (GAMA), sales figures show strong gains for both piston and turbojet aircraft in 2000. In the first 3 quarters of 2000, general aviation aircraft shipments totaled 2000 units--an increase of 16.3 percent over the same period in 1999. This marks the sixth consecutive year of increased demand for general aviation aircraft. Shipments of piston aircraft and jets were up 13.8 and 15.1 percent, respectively. While shipments of turboprop aircraft have been mixed over the past several years (down 2.6 percent in 1999), shipments for this category of aircraft were up 36.3 percent during the first 9 months of 2000.



The continued increase in new aircraft sales and deliveries can be attributed to a number of factors: the strength of the U.S. economy; the tremendous success of fractional ownership companies; and an increase in the number of traditional flight departments being operated by corporate America. In addition, there are numerous new product offerings, including the Boeing Business Jet, the Cessna 172 Skyhawk and 182 Skylane, the Cessna Stationair and Turbo Stationair, the Piper Meridian, and the Mooney Eagle. Other recently certificated products include the Cirrus SR20 and the

Lancair Columbia 300--which had its first delivery in early 2000.

Billings for general aviation aircraft totaled $6.25 billion for the first 9 months of 2000, an increase of 10.4 percent from the corresponding 1999 figure. Over the same period, export shipments are up by 11.3 percent to 444 aircraft. However, export billings decreased by 20.7 percent to $1.44 billion for this 9-month period. Exports represent about 22 percent of all U.S. manufactured aircraft shipped.



PILOT POPULATION

At the end of 2000, the total pilot population totaled 648,539, over 13,000 more pilots (up 2.1 percent) than a year earlier. All four major groupings—student, private, commercial, and airline transport—registered increases in 2000. These four pilot groupings totaled 630,750 and accounted for 97.3 percent of all pilots in 2000. The three strictly general aviation groupings totaled 491,050 and accounted for 75.7 percent of all pilots.

The estimated number of active student pilots for 2000 is 104,150, up 2.1 percent from the 1999 estimate of 102,000, but less than last year's forecast of 106,100 for 2000.[2]

Industry initiatives are underway to continue the positive growth in student pilots since they are seen as the future of general aviation. The industry's efforts to revive the market for its products and services will, in large part, depend on how successful its programs are in attracting new pilots. The increased supply for student pilots may not only be generated by those seeking private pilot certificates for personal enjoyment, but also for those seeking a career in aviation. Driven by the requirements of commercial air carriers (including regionals/commuters), fractional ownership providers, and corporate flight departments, there is a perceived demand for additional commercial and air transport pilots.

Private pilots totaled 260,700 (up 0.8 percent) in 2000 while the number of commercial pilots totaled 126,200 (up 1.6 percent). The number of airline transport pilots (139,700) was up 1.5 percent in 2000, the 44th consecutive year that this category has posted increased numbers.

The number of helicopter pilots (those holding helicopter certificates only) increased by 3.7 percent to 8,015 in 2000. The number of glider pilots (9,430) increased slightly in 2000 while the number of recreational pilots (344) remained basically unchanged.

The number of instrument-rated pilots (315,100) increased 2.0 percent in 2000. Instrument-rated pilots are currently 57.9 percent of total active pilots (excluding student and recreational

[2] In reporting its active student pilot statistics for 1999, staff at the FAA Aeronautical Center, which maintains the official airmen certification records, noted that the reported number were likely in error. This was due to computer software and data processing problems that prevented the Civil Aeronautical Medical Institute from transmitting data to the Comprehensive Airmen Information System starting in August 1999. Some of these problems have yet to be resolved and, as such, the FAA in consultation with industry representatives, developed an estimate of 104,150 active student pilots for the year 2000. This estimate is based on the number of active student pilots at year-end 1999 less the expected attrition due to non-renewal of student certificates. The number of new student pilot certificates issued and student certificates renewed during 2000 are added to this number.

pilots), basically the same percentage as in 1999. This represents an increase from the 55.5 percent share in 1995, and reflects the increased sophistication of both aircraft and pilots utilizing the National Airspace System.

ACTIVITY AT FAA AIR TRAFFIC FACILITIES

General aviation activity at combined FAA and contract towered airports declined slightly in fiscal year 2000; this following 3 consecutive years of strong traffic growth--up 13.4 percent over 1996-99 period. In 2000, general aviation operations totaled 39.9 million, a decline of 0.5 percent over 1999. Most of the decline occurred in itinerant operations (22.8 million), which were down 0.8 percent. Local operations remained basically flat in 2000 at 17.0 million. Since 1996, local operations are up 17.5 percent and itinerant operations are up 9.7 percent.

In 2000, the top 10 general aviation airports, as ranked by operations, accounted for 9.1 percent of general aviation activity at the 459 combined FAA/contract towers, and 5.3 percent of total aircraft activity at towered airports. Of the top 10 airports, three are in California, two each are in Florida and Texas, and Arizona, Colorado, and Washington each have one. Four of the top 10 airports experienced a decline in operations since 1996.

The 10 fastest growing general aviation airports, as ranked by the percentage increase in operations, grew from 456,772 general aviation operations in 1996 to almost 1.1 million in 2000, an increase of 130.9 percent. These 10 airports account for 2.6 percent of all general aviation activity. The two fastest growing airports during this four-year period were Wilkes-Barre/Scranton, which grew by 191.1 percent (from 33,921 operations to 98,753 operations), and San Antonio/Stinson, which grew by 182.3 percent (from 50,766 to 143,315 operations).

TABLE V-1

FASTEST GROWING GENERAL AVIATION AIRPORTS RANKED BY % CHANGE IN OPERATIONS: 1996-2000

Fac. Id.	City/Airport	2000	1996	% Ch. 96-00
AVP	Wilkes-Barre/Scran. Intl	98,753	33,921	191.1
SSF	San Antonio/Stinson Field	143,315	50,766	182.3
FAT	Fresno Yosemite Int'l.	202,026	80,022	152.5
MSP	Minneapolis-St. Paul Int'l.	128,497	55,004	133.6
CVG	Covington/Cincinnati Int'l.	32,160	14,511	121.6
BTL	Battle Creek/Kellogg	98,194	44,436	121.0
KOA	Kailua/Kona Int'l.	42,244	19,694	114.5
PMP	Pompano Beach Airpark	184,852	92,513	99.8
HLG	Wheeling/OH County	34,059	17,887	90.4
BKL	Cleveland/Burke Lakefront	90,551	48,018	88.6

Four of the fastest growing airports, Fresno Yosemite, Pompano Beach, San Antonio/ Stinson, and Minneapolis-St. Paul also made the list of top 100 general aviation airports as ranked by operations. They are ranked 39th, 52nd, 83rd, and 100th, respectively. The list of top 10 fastest growing general aviation airports also includes two commercial air carrier hubs--Minneapolis-St. Paul International (MSP) and Covington/Cincinnati International (CVG).

General aviation activity at the 29 large hub airports[3] totaled 1.5 million in 2000, up 0.9 percent over 1999 and 10.1 percent over the 4 years since 1996. Of the 29 large hubs, 16 have recorded increased general aviation operations over the 4-year period. The three major hubs with the largest number of general aviation operations in 2000 were Minneapolis/St. Paul (128,497 operations), Las Vegas/McCarran (119,100 operations), and Phoenix Sky Harbor (116,389 operations). In 2000, general aviation operations as a percent of total operations at these three airports, were 24.5, 22.2, and 18.6 percent, respectively.

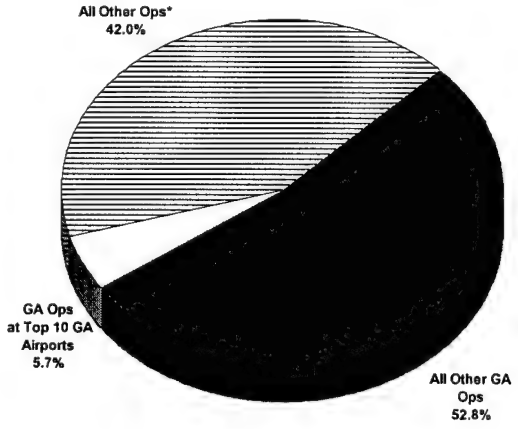
General aviation instrument operations at combined FAA and contract tower airports

[3] Defined by the DOT as an airport enplaning one percent or more of total U.S. passenger enplanements.

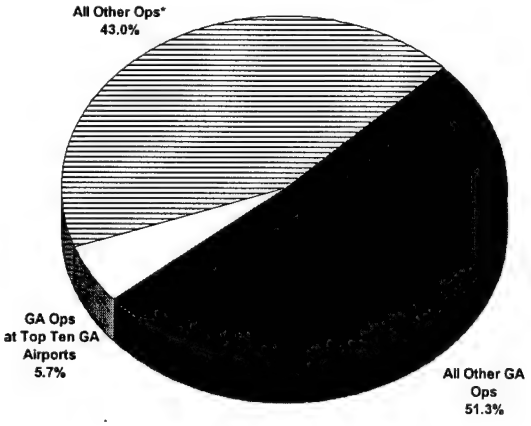
LARGEST GENERAL AVIATION AIRPORTS RANKED BY FY 2000 AIRCRAFT OPERATIONS

Facility ID	City/Airport	2000	1996
VNY	Van Nuys	518,682	528,659
LGB	Long Beach/Daughtery Field	392,747	467,412
APA	Denver/Centennial	382,443	361,228
SFB	Orlando/Sanford	363,268	255,923
DAB	Daytona Beach International	358,425	290,438
DVT	Phoenix-Deer Valley Municipal	343,933	373,310
PRC	Prescott/E A Love Field	325,061	298,462
FTW	Fort Worth Meacham	318,566	339,203
SNA	Santa Ana/John Wayne	312,627	299,309
BFI	Seattle/Boeing Field	299,234	280,800
	Operations -- Top 10 GA Airports	**3,614,986**	**3,526,343**
	Total GA Operations	**39,723,673**	**35,298,290**

PERCENT OF AIRCRAFT OPERATIONS BY TYPE OF AIRCRAFT OPERATIONS



2000

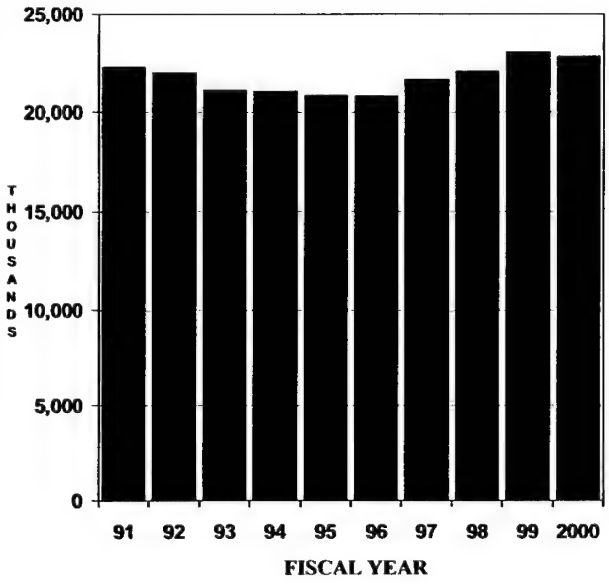


1996

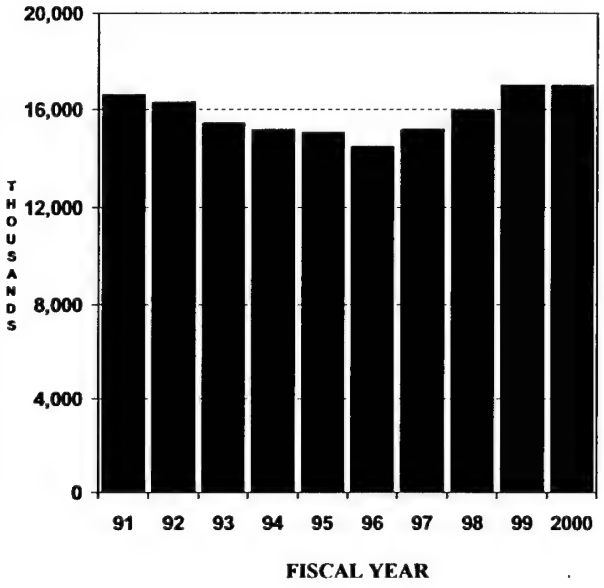
*Includes air carrier, air taxi/commuter, and military operations.

GENERAL AVIATION ACTIVITY

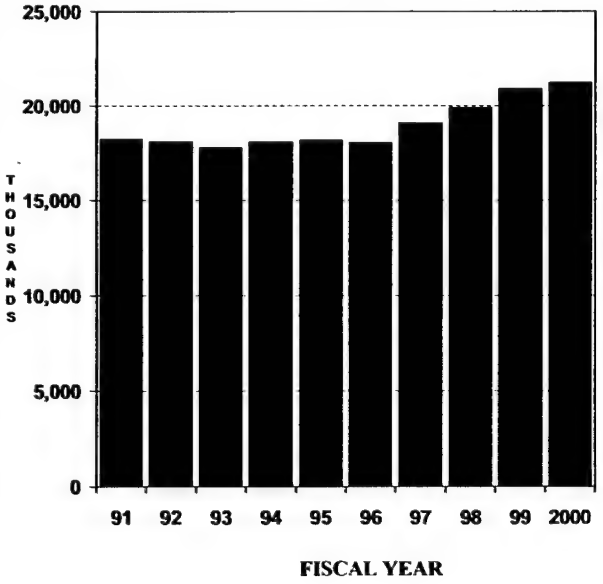
ITINERANT AIRCRAFT OPERATIONS (FAA AND CONTRACT TOWERS)



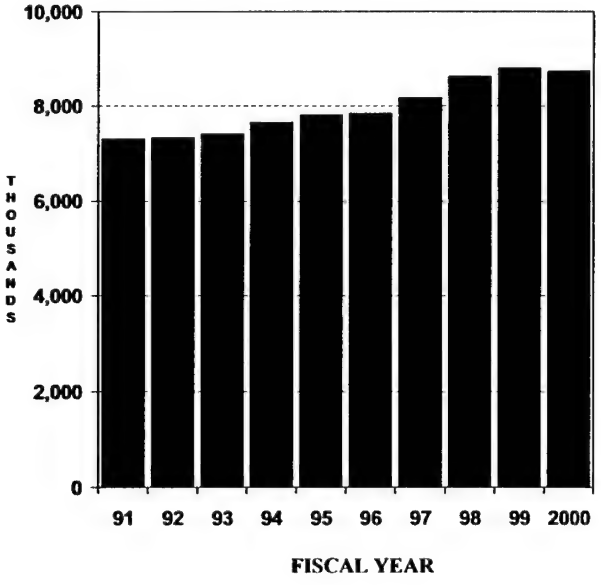
LOCAL AIRCRAFT OPERATIONS (FAA AND CONTRACT TOWERS)



INSTRUMENT OPERATIONS (FAA AND CONTRACT TOWERS)



IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



(21.3 million) increased 1.8 percent in 2000, up for the fourth consecutive year. General aviation instrument operations have now increased during 6 of the last 7 years, with activity gains totaling 19.2 percent over the period.

The number of general aviation aircraft handled at en route centers (8.7 million) also declined slightly (0.7 percent) in 2000. This decline came after eight consecutive years of increased activity, a period during which general aviation activity increased 20.3 percent.

While the increases in local operations since 1996 (up 17.5 percent) coincide with the resurgence in the number of student pilots and increased instructional flying, the gains in instrument and en route operations accompany the expanding fleet of turbojet aircraft and the increase in longer-range business/corporate traffic.

1999 GENERAL AVIATION AND AIR TAXI ACTIVITY SURVEY

The historical general aviation active fleet and hours flown discussed in this chapter and Chapter VI (Helicopters) are derived from the General Aviation and Air Taxi Activity (and Avionics) Survey (GA Survey). This survey is conducted annually (avionics questions are included only every other year) by the FAA's Statistics and Forecast Branch. The fleet data are estimated using a sample from the FAA Aircraft Registry. As in any sample survey, variability could be caused by traditional sampling error and by nonsampling errors. With small groups (such as rotorcraft, turbojets, etc.), the estimates are heavily influenced not only by the number of respondents, but also by who responds. For example, if a large operator with high utilization rates for a particular aircraft type responded to the survey one year but not the next, the effect would be to reduce the activity estimates for that particular aircraft type. This would happen even if that operator had no change in activity for that particular year.

To improve on response, the survey is accompanied by a letter of endorsement from eight general aviation trade associations in addition to that of the FAA, which stresses the confidentiality of the individual survey responses and the importance of the survey data to the industry and its members. This is thought to have improved the quality of the responses, i.e., respondents were more likely to report their true activity rather than reporting that the aircraft did not fly during the past year.

Several changes have been made to the survey, which have caused some discontinuities in the historical series. For a description and discussion of changes to the surveys conducted in 1993 through 1996, please refer to previous year's forecast publications. Also, with the processing of the 1997 survey data, changes in edits and estimation resulted in substantial upward revisions in survey estimates of fleet size and hours for 1995 and 1996. Estimates for earlier years were not revised and so may not be comparable to those for 1995 and later years.

To adjust for the effect of nonresponse, telephone surveys were conducted during the summers of 1997 (1996 Survey) and 1999 (1998 Survey) to determine the utilization of aircraft whose owners failed to respond to the mail survey. Results from the 1997 and 1999 telephone surveys posed mixed results, i.e., the 1997 survey suggested that aircraft owned by those not responding to the mail survey had higher utilization rates than those who responded while the 1999 survey suggested the opposite. The active fleet estimates for 1991 through 1995 were revised to reflect the higher level of utilization rates recorded in the 1997 telephone survey. In effect, the historical series

for 1991 through 1997 is a consistent series that can be used for developing trends.

Based on the inconsistencies that appeared between the 1997 and 1999 telephone survey results, the combined results of the two telephone surveys were used to adjust the 1998 survey results. However, no adjustments were made to previous year estimates. This adjustment, combined with other changes in estimating procedures, has resulted in some apparent anomalies with respect to historical trends, particularly in the single and multi-engine aircraft categories. The telephone survey of non-respondents conducted in 2000 (the 1999 survey) did not have a high enough level of confidence to warrant inclusion in the survey estimates. In fact, this method of adjustment is not likely to be used in future year's surveys.

Since one of the most critical uses of the GA Survey results is in the estimation of General aviation aircraft utilization—annual hours flown per aircraft--the 1999 GA Survey sample was allocated so as to improve the precision of the hours flown estimates, i.e., to minimize the variability in the estimates of hours flown. Further, the design and appearance of the survey questionnaire was changed to improve its visual appeal and to make it easier to answer survey questions. These changes resulted in a significant decrease in item non-response for the questionnaires that were returned completed. These two modifications also have had the effect of improving survey results by reducing response bias.

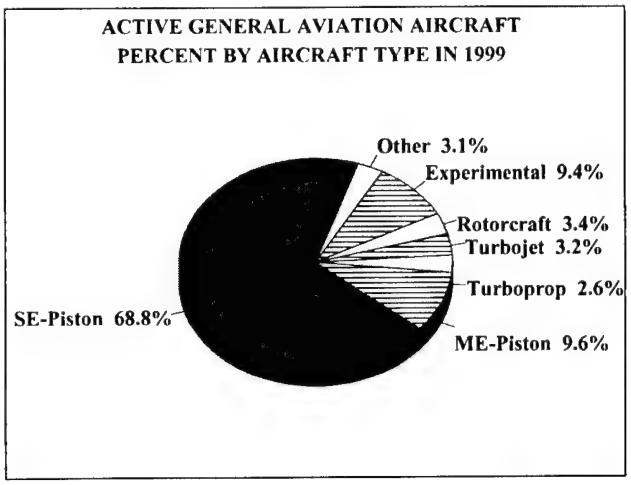
The results of the 1999 survey for active fleet and hours flown, by aircraft type and use category, as well as the fleet and hours for the period 1994 to 1999, are detailed in Tables V-2 through V-5 on the following pages.

The 1999 survey results, collected during 2000, for active general aviation aircraft are reported as of December 31, 1999. The 1999 survey results for hours flown, collected during 2000, are reported as calendar year 1999.

ACTIVE AIRCRAFT

Based on the results of the 1999 GA Survey, there are an estimated 219,464 active general aviation aircraft.[4] The active fleet has now increased for 5 consecutive years, up 26.9 percent over this 5-year period and up 7.2 percent in 1999.

Single-engine piston aircraft continue to dominate the fleet in 1999, accounting for 68.8 percent of the total active fleet. The next largest groups are multi-engine piston (9.6 percent) and experimental aircraft (9.4 percent). Turboprops, turbojets, and rotorcraft make up relatively small shares of the active fleet, accounting for 2.6, 3.2, and 3.4 percent, respectively.



The hours flown chart on the following page shows that higher utilization rates provide turboprops, turbojets and rotorcraft a disproportionate share of the total hours flown. These three aircraft categories constitute less than 10 percent of the active fleet but account for nearly 23 percent of total hours flown.

The 1999 GA Survey results for individual aircraft categories are as follows:

[4] An active aircraft is an aircraft flown at least one hour during the survey calendar year – i.e., one hour in 1999.

- The number of active fixed-wing piston aircraft totaled 171,923, up 5.5 percent;
  - single-engine piston aircraft increased from 144,234 to 150,886, up 4.6 percent, and
  - multi-engine piston aircraft increased from 18,729 to 21,038 up 12.3 percent.[5]

- The number of active fixed-wing turbine aircraft totaled 12,799, up 4.6 percent;
  - turboprop aircraft decreased from 6,174 to 5,679, down 8.0 percent, and
  - turbojet aircraft increased from 6,066 to 7,120, up 17.4 percent.

- The active rotorcraft fleet totaled 7,448, up 0.3 percent;
  - turbine-powered rotorcraft increased from 4,881 to 4,884, and
  - piston-powered rotorcraft increased from 2,545 to 2564.

- Active experimental aircraft totaled 20,528, an increase of 24.4 percent;
  - amateur builts increased from 13,189 to 16,858, up 27.8 percent,
  - exhibition aircraft increased from 1,630 to 1999, up 22.6 percent, and
  - other experimental aircraft decreased from 1,684 to 1,671, down 0.8 percent.

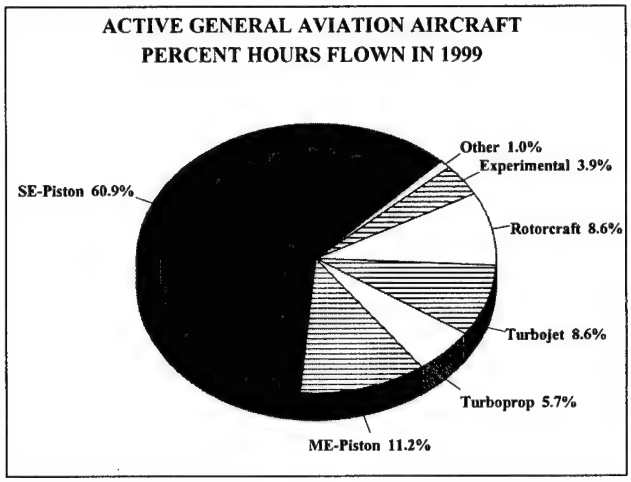
- The "other aircraft" category increased from 5,580 to 6,765, up 21.2 percent;
  - gliders decreased from 2,105 to 2,041, down 3.0 percent, and
  - lighter-than-air aircraft increased from 3,475 to 4,725, up 36.0 percent.

One explanation for the large percentage growth or declines for individual aircraft categories may be the result of understated or overstated 1997 and 1998 estimates. This is particularly true for the experimental aircraft category, which recorded gains of 24.4 and 12.4 percent in 1999 and 1998, respectively, following a decline of 11.7 percent in 1997.

[5] This relative large increase can be explained by two factors: (1) an increase in the registered multi-engine piston aircraft population over the last few years; and (2) an increase in the estimated number of active aircraft in the population.

HOURS FLOWN

Based on the results of the 1999 GA Survey, the hours of flown by general aviation aircraft totaled 31.8 million, up 13.0 percent from the 28.1 million reported for 1998. The number of hours flown by general aviation aircraft has increased for 5 consecutive years, showing an increase of 31.8 percent for the 5-year period.



The 1999 Survey results for the individual aircraft categories are as follow:

- Hours flown by fixed-wing piston aircraft (72.1 percent of total hours flown) totaled 22.9 million, an increase of 12.2 percent;
  - single-engine piston aircraft hours (19.3 million) an increase of 14.9 percent,
  - multi-engine piston aircraft hours (3.6 million) decreased by 0.3 percent.

- Hours flown by fixed-wing turbine aircraft totaled 4.5 million hours an increase of 14.0 percent;
  - hours flown by turboprop aircraft were up 2.6 percent, and

- hours flown by turbojet aircraft were up 23.0 percent.

- Rotorcraft hours flown (2.7 million) were up 17.2 percent from 1998;
  - turbine powered rotorcraft flew 2.2 million hours (up 14.4 percent), and
  - piston-powered rotorcraft flew 0.6 million hours (up 29.3 percent).

- The number of hours flown by experimental aircraft (1.2 million) increased 16.4 percent over the year, but is still 6.0 percent below the 1997 figure.

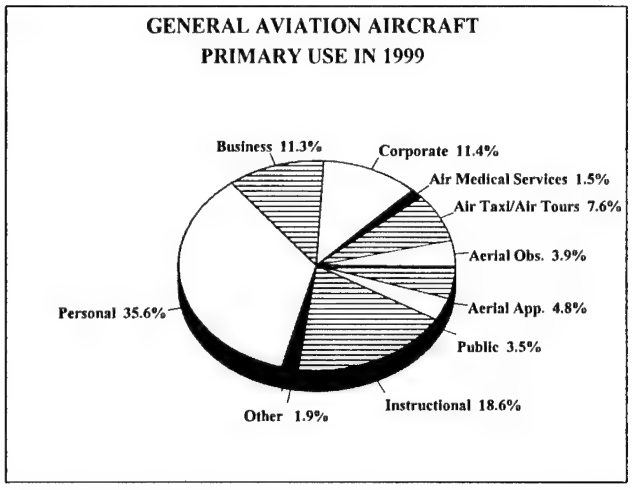
PRIMARY USE OF AIRCRAFT

A public use category was added to the Survey in 1996. Because of this change in classification of activity, comparisons with 1995 or earlier data should be made with caution. The 1999 survey also included a new use category--Air Medical Services--and eliminated the catchall "Other" category

Personal (35.6 percent) and instructional flying (18.6 percent) were the two largest uses of general aviation activity in 1999, accounting for 54.2 percent of all hours flown. Personal use flight hours (11.3 million) were up 15.5 percent from 1998 while instructional hours (5.9 million) were up 48.8 percent.[6]

Corporate (11.4 percent) and business (11.3 percent) flying, the third and fourth largest uses for general aviation, were up 6.9 percent in 1999. Corporate hours were up 12.5 percent while business hours increased 2.1 percent. This increase is consistent with the increased numbers of business jets delivered over recent years and is also supported by the increase in the number of turbojet hours in corporate and business use—up 17.3 percent in 1999.

Although air taxi activity (6.0 percent of total hours) declined 21.0 percent in 1999, this category of flying is still up 22.8 percent over the past 5 years. While this use category has had some fluctuations over the past several years, the estimates appear reasonable, especially considering the rule changes and other issues regarding part 135 operators.



In 1999, hours for aerial observation (1.2 million, 3.9 percent of total hours) were up 53.1 percent, although this use category is still slightly below its 1997 level of 1.3 million hours. Public use, 3.5 percent of all hours flown, decreased by 19.1 percent from 1998, but some of this decline may result from confusion about the definition of the Public Use category.

Aerial application (1.5 million, 4.8 percent of total hours) recorded a 17.5 percent increase in 1999. External load, other work, sightseeing and air tours accounted for a combined 3.5 percent of total hours hhile the new Air Medical Services category (458,000 hours) accounted for the remaining 1.3 percent of activity.

[6] The large decline reported in instructional hours for 1998 appears inconsistent with industry and government statistics on student pilot trends in 1998-99, especially in light of the large reported increase in this category in 1999. Additionally, the 1999 hours appear to be more consistent with the general upward trend noted since 1994.

TABLE V-2

GENERAL AVIATION ACTIVE AIRCRAFT BY AIRCRAFT TYPE

(In Thousands)

AIRCRAFT TYPE	1999	1998	1997	1996 1/	1995 1/	1994
Fixed Wing - Total	**184.7**	**175.2**	**166.8**	**163.7**	**162.3**	**150.2**
Piston -- Total	**171.9**	**163.0**	**156.1**	**153.6**	**152.8**	**142.2**
One Engine	150.9	144.2	140.0	137.4	137.0	127.4
Two Engine	20.9	18.7	15.9	16.1	15.7	14.8
Other Piston	0.1	0.1	0.1	0.1	0.0	0.1
Turboprop -- Total	**5.7**	**6.2**	**5.6**	**5.7**	**5.0**	**4.1**
Single Engine	1.0	1.0	0.7	0.7	0.7	0.5
Two Engine	4.6	5.1	4.9	4.9	4.3	3.6
Other Turboprop	0.0	0.1	0.0	0.1	0.0	0.0
Turbojet -- Total	**7.1**	**6.1**	**5.2**	**4.4**	**4.6**	**3.9**
Two Engine	6.4	5.5	4.6	4.1	4.1	3.7
Other Turbojet	0.7	0.6	0.5	0.3	0.5	0.3
Rotorcraft -- Total	**7.4**	**7.4**	**6.8**	**6.6**	**5.8**	**4.7**
Piston	2.6	2.5	2.3	2.5	1.9	1.6
Turbine	4.9	4.9	4.5	4.1	4.0	3.1
Single Engine	4.0	4.0	3.8	3.4	3.2	2.5
Multi-engine	0.8	0.8	0.8	0.6	0.7	0.6
Other -- Total	**6.8**	**5.6**	**4.1**	**4.2**	**4.7**	**5.9**
Experimental -- Total	**20.5**	**16.5**	**14.7**	**16.6**	**15.2**	**12.1**
Total All Aircraft	**219.4**	**204.7**	**192.4**	**191.1**	**188.1**	**172.9**

SOURCE: 1994 - 1999 General Aviation Activity and Avionics Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

N/A = Not applicable

Columns may not add to totals due to rounding and estimation procedures.

TABLE V-3

TOTAL GENERAL AVIATION HOURS FLOWN BY AIRCRAFT TYPE
(In Thousands)

AIRCRAFT TYPE	1999	1998	1997	1996 1/	1995 1/	1994
Fixed Wing - Total	**27,444**	**24,392**	**24,111**	**23,402**	**23,196**	**21,203**
Piston -- Total	**22,895**	**20,402**	**20,743**	**20,091**	**20,251**	**18,823**
One Engine	19,325	16,823	18,345	17,606	17,831	16,404
Two Engine	3,551	3,567	2,380	2,474	2,416	2,408
Other Piston	18	11	19	11	4	11
Turboprop -- Total	**1,811**	**1,765**	**1,655**	**1,768**	**1,490**	**1,142**
Single Engine	357	289	321	328	292	203
Two Engine	1,450	1,459	1,326	1,419	1,181	939
Other Turboprop	4	17	9	22	17	0
Turbojet -- Total	**2,738**	**2,226**	**1,713**	**1,543**	**1,455**	**1,238**
Two Engine	2,435	1,995	1,557	1,385	1,352	1,172
Other Turbojet	303	231	155	158	102	66
Rotorcraft -- Total	**2,744**	**2,342**	**2,084**	**2,122**	**1,961**	**1,777**
Piston	556	430	344	591	337	369
Turbine	2,188	1,912	1,740	1,531	1,624	1,408
Single Engine	1,744	1,415	1,311	1,282	1,218	1,049
Multi-engine	443	497	429	249	406	359
Other -- Total	**318**	**295**	**192**	**227**	**261**	**388**
Experimental -- Total	**1,247**	**1,071**	**1,327**	**1,158**	**1,194**	**724**
Total All Aircraft	**31,754**	**28,100**	**27,713**	**26,909**	**26,612**	**24,092**

SOURCE: 1994 - 1999 General Aviation Activity and Avionics Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

N/A = Not applicable

Columns may not add to totals due to rounding and estimation procedures.

TABLE V-4

GENERAL AVIATION ACTIVE AIRCRAFT BY PRIMARY USE CATEGORY

(In Thousands)

USE CATEGORY	1999	1998	1997	1996 1/	1995 1/	1994
Public Use	4.1	4.0	4.1	4.5	N/A	N/A
Corporate	10.8	11.3	10.4	9.9	10.6	9.4
Business	24.5	32.6	27.7	30.7	28.3	26.5
Personal	147.1	124.3	115.6	113.4	113.4	102.5
Instructional	16.1	11.4	14.7	12.7	14.2	15.0
Aerial Application	4.6	4.6	4.9	5.0	5.0	4.3
Aerial Observation	3.2	3.2	3.3	3.0	4.7	5.1
External Load	0.2	0.3	0.2	0.4	0.2	0.1
Other Work	2.4	1.1	0.7	1.0	1.1	1.2
Sightseeing	0.8	0.7	0.7	0.7	0.8	1.3
Air Tours	0.3	0.3	0.2	0.1	0.2	N/A
Air Taxi	4.3	4.9	4.8	4.1	3.8	3.8
Other	N/A	6.0	5.3	5.6	5.9	4.2
Air Medical Services	0.8	N/A	N/A	N/A	N/A	N/A
TOTAL	**219.4**	**204.7**	**192.4**	**191.1**	**188.1**	**172.9**

SOURCE: 1994 - 1999 General Aviation Activity and Avionics Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

N/A = Not applicable.

Columns may not add to totals due to rounding and estimation procedures.

TABLE V-5

TOTAL GENERAL AVIATION HOURS FLOWN BY USE CATEGORY

(In Thousands)

USE CATEGORY	1999	1998	1997	1996 1/	1995 1/	1994
Public Use	1,111	1,373	1,096	1,047	N/A	N/A
Corporate	3,616	3,213	2,878	2,898	3,069	2,486
Business	3,598	3,523	3,006	3,259	3,335	3,012
Personal	11,294	9,781	9,644	9,037	9,659	8,248
Instructional	5,893	3,961	4,956	4,759	4,410	4,382
Aerial Application	1,535	1,306	1,562	1,713	1,526	1,364
Aerial Observation	1,243	812	1,261	1,057	1,391	1,746
External Load	128	153	112	191	128	135
Other Work	813	286	139	265	280	241
Sightseeing	220	169	127	195	179	309
Air Tours	146	183	114	100	124	N/A
Air Taxi	1,897	2,400	2,008	1,734	1,403	1,545
Other	N/A	940	819	656	1,107	622
Air Medical Services	461	N/A	N/A	N/A	N/A	N/A
TOTAL	**31,755**	**28,100**	**27,713**	**26,909**	**26,612**	**24,092**

SOURCE: 1994 - 1999 General Aviation Activity and Avionics Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

N/A = Not applicable.

Columns may not add to totals due to rounding and estimation procedures.

REVITALIZATION OF AN INDUSTRY

General aviation continues to be a dominant force in aviation. At year-end 1999 there were 19,098 civil and joint use airports/heliports in operation, with 5,324 available for public use. Of these, 655 airports had commercial service certificates (also used by general aviation). This leaves a total of 18,443 airports/heliports (96.6 percent) used exclusively by general aviation aircraft, with 4,669 available for public use.

General Aviation represents the largest percentage of civil aircraft in the United States and accounts for the majority of operations handled by towered and nontowered U.S. airports, as well as for the majority of certificated pilots in the U.S.

In 1999, there were over 227,000 active civil aircraft in the United States. This includes 219,465 active general aviation aircraft (over 96 percent of the active fleet), nearly 6,000 passenger or cargo jet aircraft air carriers, and over 2,000 regional/commuter aircraft.

Of the 635,472 certificated pilots at the end of 1999, private pilots accounted for more than 40.0 percent of the total. In addition, general aviation itinerant and local operations totaled 39.9 million in 2000, 58.0 percent of the total 68.7 million operations at towered and nontowered U.S. airports.

OPTIMISM IN THE INDUSTRY

August of 2000 marked the sixth year since the passage of the General Aviation Revitalization Act (GARA). Since that time, general aviation shipments and billings have more than doubled. The General Aviation Manufacturers Association (GAMA) estimates that more than 25,000 manufacturing jobs have been created in the general aviation industry as a result of GARA. GAMA also reports increases in general aviation exports, new products as a result of increases in research and development by its members, and an increase in the number of student pilots.

General aviation is also coming off another record year for billings in 1999, and the year 2000 is likely to set yet another record. Shipments of aircraft are up in all aircraft categories--piston, turboprop, and jet--with all three categories registering double-digit percentage increases through 3 quarters of 2000. Although turboprop and turbojet shipments are up substantially in 2000, the market continues to be dominated by shipments of piston aircraft.

The strength of general aviation's recovery and the positive outlook throughout the industry can be attributed to a strong U.S. economy and the passage of the GARA, which brought product liability reform to the industry.

From 1994 through 1999, shipments of general aviation aircraft have increased at an average annual rate of over 17.8 percent, from 928 units shipped in 1994, to 2,525 units shipped in 1999. It appears that 2000 will also show an increase in shipments.

One of the reasons cited for the rise in shipments is the success of the Cessna single-engine piston models introduced in 1997. Cessna has recently announced both plans and orders for four new Citation models, the CJ1, CJ2, Sovereign, and Ultra Encore. It is also anticipated that Raytheon will begin deliveries of its Premier I, an entry-level jet that features a composite fuselage with metal wings, this year. Raytheon will follow delivery of the Premier I with its Hawker Horizon, for which deliveries are scheduled to begin in 2001. Mooney is set to begin deliveries of its new aircraft--the Eagle. The New Piper Aircraft, Inc., recently rolled out

its first turbine-powered aircraft, the Malibu Meridian, and expects to begin deliveries in 2000.

Another sign of optimism to the industry is the entry of commercial manufacturers into the general aviation aircraft market. Boeing Business Jets plans to build a larger version of its long-range corporate jet--the BBJ-2. Boeing Business Jets, a joint enterprise of Boeing and General Electric, entered the market a year ago with a long-range BBJ based on a hybrid of the B737-700/800 aircraft used in scheduled commercial service. The first BBJ-2 is expected to be delivered in early 2001. Airbus and Fairchild are also marketing business jets that are based on aircraft originally designed for commercial operations.

Some kit builders are now becoming production companies at the entry level. Cirrus Design Corporation has received a Production Certificate from the FAA for the SR20. This aircraft incorporates the Cirrus Airframe Parachute System (CAPS), a device designed to lower the entire aircraft to the ground in case a catastrophic event eliminates opportunities for control of the aircraft.

Since their start in the 1980s, fractional ownership providers have steadily increased their customer base. According to the National Business Aircraft Association (NBAA), at the end of 2000 there were nearly 2,100 entities involved in fractional ownership of over 500 aircraft. Despite this record growth, it is believed only a small percentage of this market has been developed.

Fractional ownership programs are filling the niche for corporations, celebrities, and business executives that do not generate enough flying to warrant a flight department. Fractional ownership providers offer the customer a more efficient use of his time by providing faster point-to-point travel times and the ability to conduct business while flying. In addition, shareholders of fractional ownerships find the minimum startup concerns and easier exiting options of great benefit.

While the fractional ownership fleet and shareholders have been growing, so to have the turbine business fleet and flight departments of Corporate America. According to the NBAA, the corporate fleet numbers 13,860 and includes 9,195 flight departments From 1993 to 2000, NBAA estimates that the corporate aircraft fleet grew at an annual rate of 5.4percent while the number of business flight departments grew at an annual rate of 4.5 percent.

The business aviation community was initially concerned that the success of fractional ownership programs would result in a shut down of corporate flight departments. These concerns have not come to fruition. Fractional ownership providers generally find their business base to be first-time users of corporate aircraft services, users that traditionally utilized commercial air transportation services. Once introduced to the benefits of corporate flying, some users of fractional programs have found it more cost beneficial to start their own flight departments, instead of incurring the costs of a larger share in a fractional ownership program. As such, the fractional ownership community may be partially responsible for the increase in traditional flight departments since 1993.

Future aircraft production schedules are being increased to meet the expected renewed demand for general aviation aircraft. The Allied Signal *Business Aviation Outlook* forecasts delivery of nearly 6,800 business aircraft over the 2000 to 2010 time period. This is up by 300 aircraft over last year's forecast. The increased numbers result from the demand for new and derivative aircraft models entering service with corporate flight departments, the rapidly expanding fractional ownership market, and the projected strong economic growth in the United States, Europe, and Latin America.

The number of amateur-built experimental aircraft in the general aviation fleet has

increased consistently for more than a quarter of a century, from 2,100 in 1970 to almost 22,000 today. It is estimated that more than 75 percent of these are active aircraft. According to the industry, about 3,200 kits were sold in 1997 and at least 1,600 were expected to be sold in 1999. The completion rate is about 63 percent (Kit Planes).

The popularity of the amateur-built aircraft results from several factors, including affordability and performance. Amateur-built experimental aircraft represent a test-bed for new technologies that will eventually be introduced in the development and manufacture of the next generation of light general aviation production aircraft. The strength of the used aircraft market and the success of the kit aircraft market demonstrate that demand still exists for affordable aircraft.

The overall general aviation accident rate per 100,000 flying hours has declined over the past 25 years, and is at its lowest rate since 1938--the first year for reporting of accident statistics. The National Transportation Safety board (NTSB) preliminary estimate for 1999 is 7.05 general aviation accidents per 100,000 hours flown, down from the 7.12 rate for 1998. This continues the trend for the general aviation accident rate, which has been declining since 1994.

FAA/Government Programs/Initiatives

The partnership between the FAA and the general aviation community is a continuous joint effort aimed at fostering industry improvements and aviation safety.

FAA Administrator, Jane F. Garvey, has indicated that the agency intends to support the growth of general aviation while continuing to improve its safety. To this end, a safety program called "Safer Skies" has been established. Together with industry, the FAA will use the latest technology to analyze U.S. and global data to find the root causes of accidents so as to determine the best actions for breaking the chain of events that lead to accidents. For general aviation, this means the FAA will embark on major data improvements, including quality, collection, and analysis.

As part of the "Safer Skies" effort, the General Aviation Joint Steering Committee has chartered a joint government/industry group called the General Aviation Data Improvement Team (GADIT). The GADIT was established to develop strategies to "increase detail about factors that have contributed to or caused general aviation accidents and incidents;" to "improve the quality and timeliness of estimates of general aviation activity;" and to "suggest alternative and innovative ways to measure the effectiveness of *Safer Skies* interventions for general aviation." The GADIT has been organized to address four areas: activity data, accident data, incident data, and metrics.

The first task--the activity data task--has been organized and several working meetings have already been held. The activity data task team expects to produce its briefing and report during the first quarter of 2001. Due to the sequential nature of the GADIT tasks, the schedule calls for completion of the metrics effort during the second half of 2002.

The FAA, the National Aeronautics and Space Administration (NASA), industry, and other government agencies and universities, are working together to improve the safety and efficiency in our transportation system. To this end, NASA and FAA are planning the Small Aircraft Transportation System (SATS). The National General Aviation Roadmap is a 25-year strategy for developing SATS. It is believed that the SATS can satisfy 21st century transportation demand by relieving pressure on existing ground and air systems, and by creating access to more communities in less time.

The goal of SATS is to provide more rapid transportation to 25 percent of "suburban, rural, and remote communities by 2007 and, to more than 90 percent by 2022." SATS plans to take a "transportation systems approach to safety for small aircraft and landing facilities." By developing an "affordable infrastructure for instrument approaches to ALL runway ends and helipads in the U.S.," SATS is expected to expand opportunities for "air transportation ... between 5,400 public use landing facilities," with the goal of "safe accessibility by air to 90 % more destinations throughout the nation," thereby encouraging "economic development for suburban, rural, and remote America." The infrastructure to support the SATS will be airports that integrate emerging communication, navigation, and surveillance technologies to produce new levels of utility for the Nation's smaller airport infrastructure.

FAA and NASA have also collaborated with the general aviation community in research programs aimed at fostering new technologies in general aviation. Two such programs are AGATE (Advanced General Aviation Transportation Experiments) and GAP (General Aviation Propulsion).

The AGATE Consortium provides a unique partnership between government, industry, and academia. The goal of AGATE is to utilize new technology to produce aircraft that are safer, easier to operate, and more affordable to today's pilot. This will be accomplished through utilization of improved avionics, more crashworthy airframes, and pilot training. NASA's GAP program focuses on development of improved piston and turbine engines.

One of the goals of FAA's Safer Skies initiative is to improve weather and other flight information. The Flight Information Service (FIS) program plans to put real time weather information in the cockpit.

The NASA "highway in the Sky" project has a goal of putting 21st Century instrumentation into the cockpit--including GPS position and weather displays. Affordable computers will provide an "intuitive pictorial of situational awareness," allowing display of a "Highway" to a preprogrammed destination. The NASA National Aviation Operational Monitoring Service (NAOMS) program has conducted a study of commercial airline pilots to develop "statistically accurate counts of key aviation safety events." This approach to research and data collection is expected to be used to study general aviation and is planned to begin in 2002.

The FAA is also committed to improving navigation through satellite based systems such as the Global Positioning System (GPS) for airport precision approach. The initial 25 Wide Area Augmentation System (WAAS) stations have been installed and certification is expected by year-end 2001. Most IFR aircraft are expected to have GPS/WAAS by 2005. The expected increase in the number of general aviation aircraft equipped with GPS/WAAS and other avionics and communications gear such as Automatic Dependent Surveillance–Broadcast (ADS-B) and 8.33 kHz (radio) channel spacing should be demonstrated in avionics tables included in the GA Survey over the next few years.

Manufacturer and Industry Programs/Initiatives

The fractional ownership industry was started just over 13 years ago and since that time has provided corporate flying services to companies that could not otherwise justify the costs associated with operating a separate flight department. During this time, fractional ownership providers have operated under Federal Aviation Regulation (FAR) Part 91, which governs general aviation. However, there is pressure for fractional ownership providers to operate under Part 135 regulations that govern commercial aircraft such as air carriers, air taxi,

and charters. FAR Part 135 providers regard fractional ownership providers as competition that benefits from the right to fly under the less restrictive FAR Part 91 standards.

The FAA has established a formal rulemaking committee, consisting of members from aircraft manufacturers, corporate flight departments, charter operators, fractional owner providers and their customers, and business aircraft management companies. The committee will review current Federal Aviation Regulations regarding fractional ownership activity and propose revisions as may be appropriate. Early last year the committee prepared a draft proposal that would require fractional ownership aircraft to operate under a subpart of Part 91.

It was submitted to the FAA and has undergone analysis to assess the economic impact of the proposed rule. The FAA is now in the process of achieving agency concurrence before notice of proposed rulemaking is issued.

Manufacturers are launching programs to make aircraft ownership easier. The New Piper Aircraft, for example, created Piper Financial Services (PFS). PFS offers competitive interest rates for the purchase and/or leasing of Piper aircraft. The Experimental Aircraft Association (EAA) has entered into an agreement with TFC Textron (formerly Green Tree Aircraft) to finance kit built planes. The general aviation industry is also seeking to increase the number of lending institutions that offer special low, competitive rates for aircraft financing.

As indicated earlier, fractional ownership of turbine powered aircraft has experienced significant growth over the past 7 years from about two dozen fractionally owned aircraft in 1993 to nearly 530 in the year 2000. With nearly 3,500 fractional shares and 2,100 fractional owners it is apparent that many fractional owners have shares in more than one aircraft – another testament to the popularity of this option of aircraft ownership.

Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. These include the "No Plane, No Gain" program sponsored jointly by GAMA and the NBAA; "Project Pilot" sponsored by the Aircraft Owners and Pilots Association (AOPA); the "Flying Start" program sponsored by EAA; and "BE A PILOT."

"No Plane, No Gain" is an advocacy program created in 1992 by GAMA and NBAA to promote acceptance and increased use of business aviation. The program promotes business aviation as a cost-effective tool for increasing the efficiency, productivity, and profitability of companies.

AOPA's "Project Pilot" promotes the training of new pilots in order to rebuild the pilot population. AOPA believes students that have mentors offering advice and help as training progresses are more likely to complete their training than students who don't have mentors.

The "BE A PILOT" program is jointly sponsored and supported by more than 100 industry organizations. The program, which started in 1996, encourages people of all ages to "Stop Dreaming, and Start Flying." The approach is multi-faceted: (1) create an influx of new pilots; (2) generate flight training leads; (3) encourage improvement in flight school marketing, and; (4) secure additional funding to expand the effort. "BE A PILOT" started issuing "introductory flight certificates" to interested respondents in May 1997. The certificates can be redeemed for a first flight lesson at a cost of $35.

In the 4 years since the program started, over 110,000 certificates have been requested. In 2000 there have been more than 35,000 requests for "Introductory Flight Certificates--up from 25,000 in past years. The program has over 1,600 participating flight schools and attracts

new market entrants via the Internet and cable-television advertising.

The program has been supported by about 100 manufacturers and other aviation businesses and organizations. They have been successful in raising funds for the effort and expect contributions for 2001 to be nearly $2 million. In the latter part of 2000, the "BE A PILOT" moved the program to a higher level of activity and effort by hiring a full-time president and chief executive. As a result the program will be expanded for 2001 to "include new initiatives in media exposure on the benefits of being a pilot for personal, business, and career interests."

Several industry organizations are also targeting young people through the Internet to peak their interest in the world of aviation. The NBAA sponsors "AvKids," a program designed to educate elementary school students about the benefits of business aviation to the community, and career opportunities available to them in business aviation. The National Agricultural Aviation Association is in the process of developing a webpage with information on careers in aerial application. GAMA offers publications, awards, and scholarships to bring education into the nation's classrooms. AOPA's "Apple Program" brings aviation into the classroom, targeting middle and high school students.

GENERAL AVIATION FORECASTS

The general aviation forecasts discussed in the following paragraphs are based on a set of economic assumptions—continuous moderate and sustained economic growth both in the United States and worldwide.

The forecast also assumes that the regulatory environment affecting general aviation will not change dramatically. Specifically, it is assumed that noise and emissions requirements on business turbine aircraft will remain within the bounds prescribed by current rules and regulations. The forecast also assumes that general aviation activity will not be subject to new user-fees or limited access to airports and airspace.

In addition, the forecast assumes that the flight school infrastructure will be improved, and that the industry will be more efficient at keeping consumers interested in aviation through its promotional "learn-to-fly" activities. It is also assumed that announced new products will enter the market and live up to their expectations in regard to price, performance, and availability.

Finally, the forecast assumes that the fractional ownership market will continue to expand and bring new operators and shareholders into business aviation. The forecast further assumes that the fractional ownership community will not by inhibited by certification and regulatory requirements.

To the extent that industry and government programs/initiatives are successful in expanding the market for general aviation products and services, the forecasts discussed in the following pages are likely to be achieved or possibly exceeded. If the industry and government programs are less than fully successful, the active general aviation fleet, hours flown, and pilots could be considerably lower than forecast.

The assumptions and growth rates developed at the FAA/Transportation Research Board's (TRB) 11th International Workshop (September 15-17, 1999) were used, with modification, in the preparation of this year's general aviation forecasts. The 12th International Workshop is scheduled to be held on September 12-14, 2001, at which time assumptions and growth rates will be reviewed and compared with realized results and new assumptions and growth rates will be developed. In addition to being updated with more current

activity indicators collected by FAA and industry, the FAA/TRB workshop assumptions and projections were supplemented with additional input from others industry experts. The findings and conclusions of the workshop panels, including the three panels on general aviation--Light General Aviation, Business Aviation, and Vertical Flight--were published by the TRB in March 2000. [7]

The current forecasts for the general aviation active fleet, hours flown, and fuel consumption use the data obtained from the 1999 survey as the base year. Therefore, the forecast period for the three activity measures extends from 2000 through 2012, and references to average annual growth rates for the forecast period include 13 years. Since final confirmed airmen data for 2000 have not been published, forecasts for certificated pilots are based on actual 1999 data obtained from the official airmen certification records maintained at the FAA Aeronautical Center in Oklahoma City and estimated year 2000 data. The forecasts for these series extend from 2000 through 2012, and the average annual growth rates also include 13 years.

ACTIVE FLEET

The forecasts of the active general aviation fleet is based, in large part, on panel discussions at the September 1999 TRB workshop. In any year, the U.S. fleet is assumed to be the sum of new production flowing into the fleet, the fleet size carried over from the previous year, and the attrition of existing aircraft during the current year. Attrition occurs from net exports, retirements, and write-offs. New production depends on economic growth and corporate profitability, new product development and introduction, and the price at which new aircraft are offered for sale.

The active general aviation aircraft fleet is expected to increase at an average annual rate of 0.9 percent over the 13-year forecast period, with the number of active aircraft increasing from 219,464 in 1999 to 245,965 in 2012. The fleet is projected to expand by about 2,200 aircraft annually through 2005 as increased aircraft production and new aircraft products enter the marketplace. The active fleet grows by just under 2,000 aircraft annually over the remaining 7 years of the forecast period.

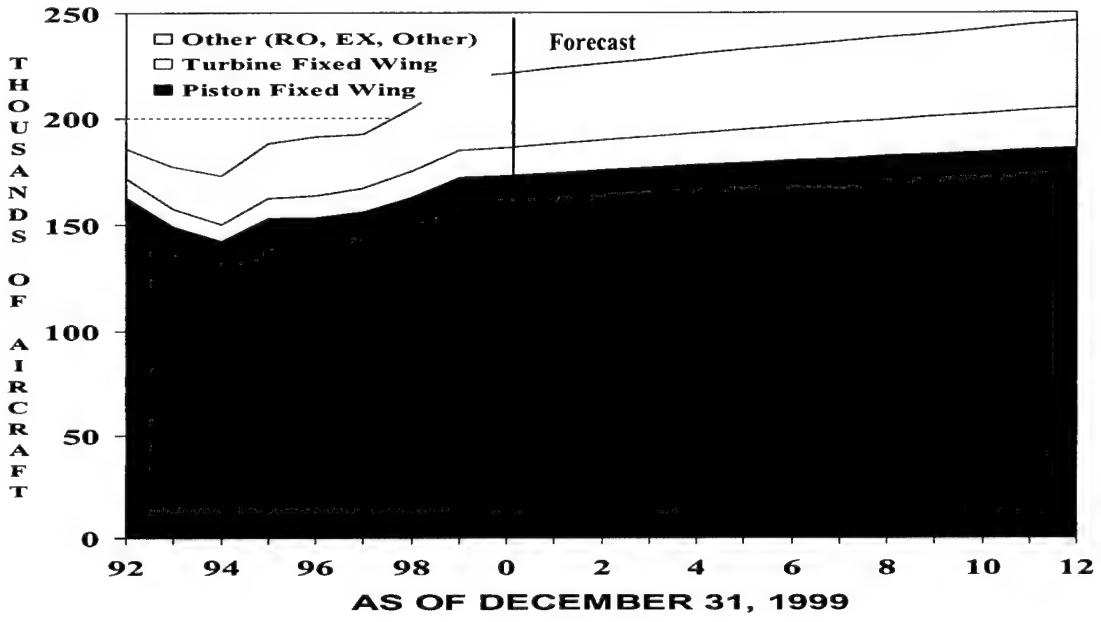
While the production of fixed-wing aircraft is almost double what is was in 1990, even after including kit built, gliders, and lighter-than-air aircraft, it is well below the goal of NASA's SATS program of 10,000 aircraft a year within 10 years, and 20,000 aircraft within 20 years.

The number of single-engine piston active aircraft is projected to increase from 150,886 in 1999 to 164,800 in 2012, an average net addition of just over 1,000 aircraft annually. Many new products have entered the market and recent product developments and ongoing research promise the addition of several new aircraft models over the forecast period.

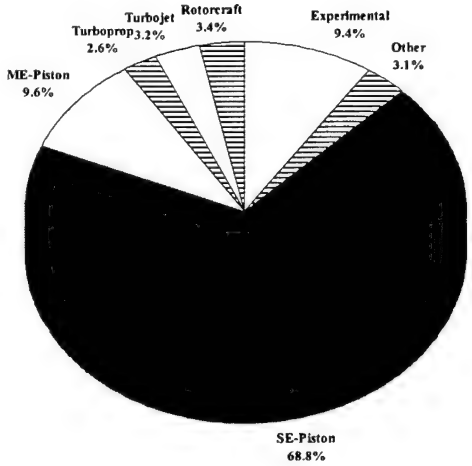
Because of the current average age of the single-engine piston fleet, large numbers of the older piston aircraft are assumed to be retired throughout the forecast period. If 100LL fuel is eliminated, attrition rates could be higher due to owners retiring their airplane rather than incurring additional costs to keep them flying. Therefore, the net growth in the single-engine piston category is expected to come largely from the introduction of new products from Cessna and Piper, and from full production being achieved by Cirrus and Lancair in the out years of the forecast period.

[7] Copies of the Report can be obtained from the Transportation Research Board, National Research Council, 2101 Constitution Avenue, NW, Washington, DC 20418.

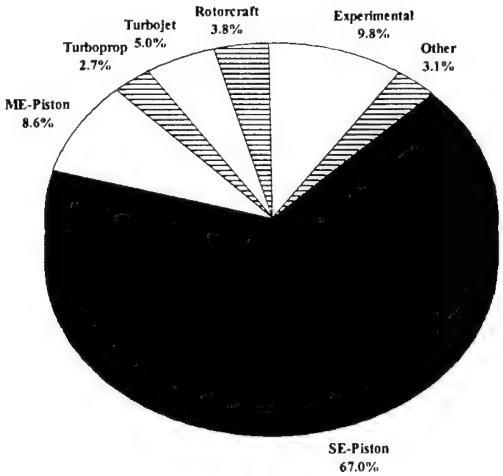
ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT



PERCENT BY AIRCRAFT TYPE



1999



2012

The size of the active multi-engine piston aircraft fleet is expected to remain basically flat at 21,200 aircraft over the 13-year forecast period. Attrition for the multi-engine piston aircraft is expected to equal production.

The turbine-powered fleet is expected to increase at an average annual rate of 3.0 percent over the forecast period. Turbojet aircraft are forecast to increase by 4.3 percent annually, from 7,120 in 1999 to 12,280 in 2012. These forecasts are based on the assumption that the turbojet fleet will increase by a net of nearly 400 aircraft annually.

Several factors are responsible for the improved market for business jets. These include a strong U.S. and global economy; the success and rapid growth the fractional ownership market, new product offerings that have stimulated buyer interests; and a shift from commercial air travel to corporate/business air travel by many business travelers and corporations.

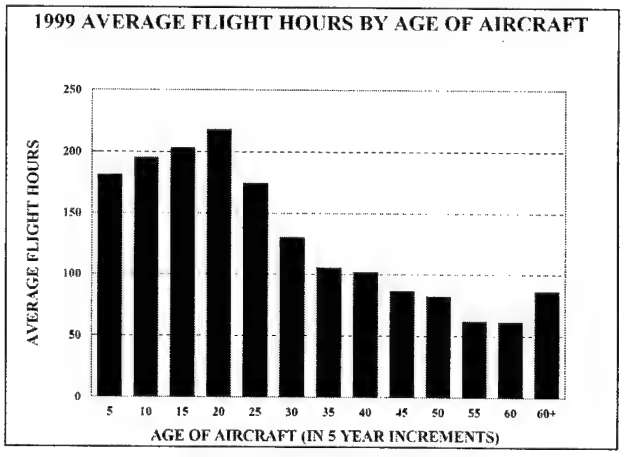
The number of turboprop aircraft is expected to grow from 5,679 in 1999 to 6,600 in 2012, an average annual growth rate of nearly 1.2 percent. These forecasts assume that the turboprop fleet grows by approximately 70 aircraft per year, counting new production and attrition.

The rotorcraft fleet is forecast to grow almost 1.9 percent annually over the 13-year forecast period, from 7,448 in 1999 to 9,460 in 2012. The turbine fleet is projected to grow at an annual rate of 1.5 percent, while the smaller piston fleet size is expected to grow at an annual rate of 2.4 percent. A detailed discussion of rotorcraft forecasts is presented in Chapter VI.

The number of experimental aircraft is projected to increase from 20,528 in 1999 to 24,080 in 2012, an average annual growth rate of 1.2 percent. Gliders and lighter-than-air aircraft are forecast to increase by 0.8 percent annually, growing from 6,765 in 1999 to 7,545 in 2012.

AIRCRAFT UTILIZATION

It is assumed that the aging of the general aviation fleet is one of the main determinants of declining utilization of general aviation aircraft. Based on results from the 1999 GA survey the average age of aircraft in active general aviation fleet is estimated to be about 27 years, with piston aircraft accounting for the majority of the aging fleet. Data from the 1999 GA Survey shows that aircraft utilization peaks at 218 hours for aircraft between 16 and 20 years old and then declines substantially after an aircraft reaches 20 years of age. The aging of the fleet appears to be one of the main causes of declining utilization of general aviation aircraft during the early and mid-1990s.

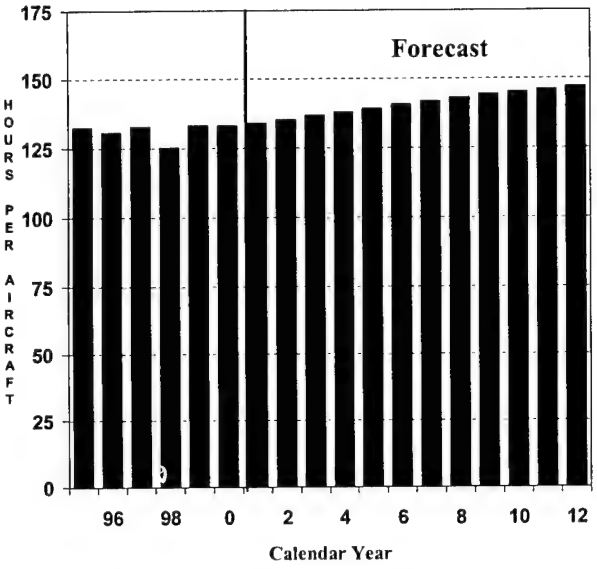


While part of the decline in utilization can be attributed to the aging of the general aviation fleet, U.S. economic slowdowns and/or recessions, such as those which occurred in 1990-91 and 1992 can also impact utilization. The expanding U.S. economy and increased consumer confidence that has prevailed since that time and appear to have stabilized or increased utilization rates. New ownership strategies, and other approaches to make flying more affordable should also be positive forces on utilization rates during the forecast period.

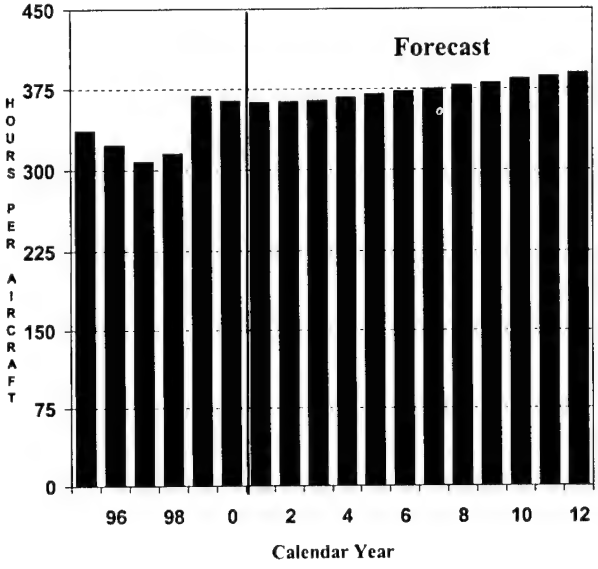
For 1999, the utilization rate for single engine piston aircraft is estimated to be approximately 128.1 hours per aircraft. Starting at this base,

GENERAL AVIATION AIRCRAFT UTILIZATION: AVERAGE HOURS PER AIRCRAFT

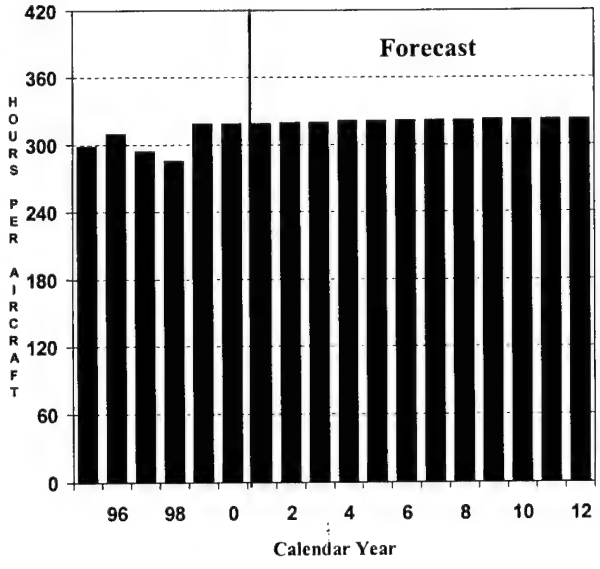
PISTON FIXED WING



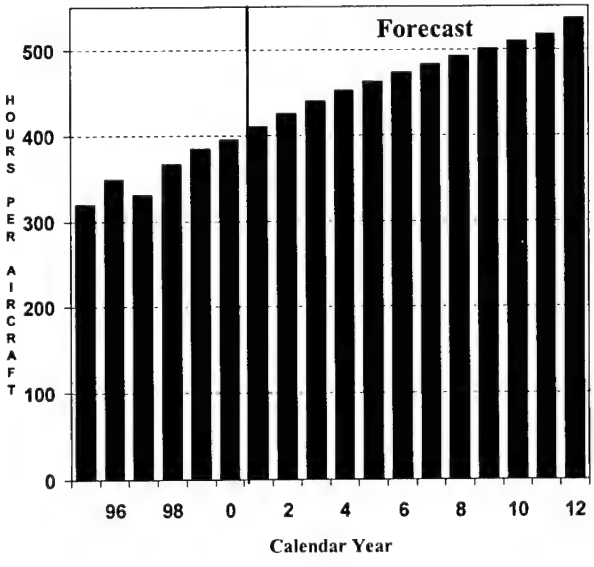
ROTORCRAFT



TURBOPROP



TURBOJET



utilization rates for single-engine piston aircraft are projected to increase to 143.5 hours in 2012, an average annual increase of 0.9 percent.

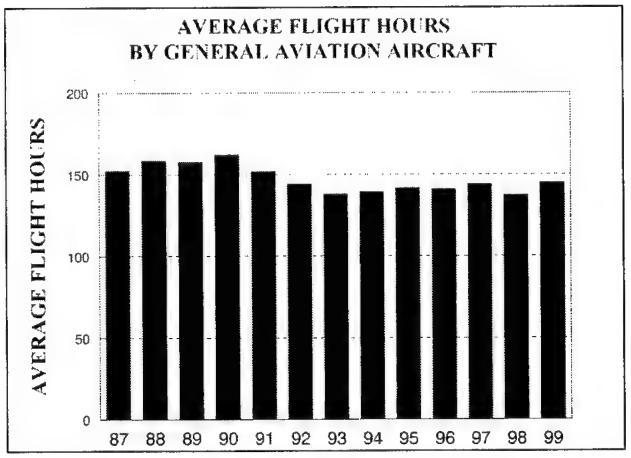
Growth in the single-engine piston utilization rate is assumed to be the result of two factors. First, utilization rates tend to be higher for newer aircraft and, with approximately 2,000 new aircraft projected to enter the fleet annually; utilization rates should increase for this fact alone. The second factor is the expected increases in the number of student pilots and aircraft that will be required for flight training. The single-engine piston aircraft used for instructional flying tend to have higher utilization rates than those of other aircraft in the same category—375 hours compared to 128 hours. Increased instructional flying will be one of factors pushing up single engine piston utilization rates over the forecast period.

In 1999, multi-engine piston aircraft utilization rates are estimated to be approximately 169.7 hours per aircraft. The utilization of multi-engine piston aircraft is forecast to grow at an average annual rate of 0.2 percent over the forecast period, reaching 174.5 hours in 2012.

In the turbine fixed-wing fleet, utilization rates for turboprops increased from 285.9 hours in 1998 to 319.0 hours in 1999. Utilization is expected to increase only slightly over the forecast period, reaching an average of 22.7 hours per aircraft in 2012. Turbojet utilization was up 4.8 percent, from an average of 367.0 hours per aircraft in 1998 to 384.6 hours in 1999. Over the forecast period, turbojet utilization is projected to grow at an average annual rate of 2.6 percent.

The increase in utilization rates for turbojets is largely attributable to the increased number of aircraft being operated by fractional ownership providers. While the average corporate jet utilization is about 300 hours per year, it is estimated that utilization for fractional ownership aircraft is about three to four times as much. The expected increase in the percentage of turbojet aircraft operated by fractional ownership providers will push the average turbojet utilization to about 536.2 hours in 2012.

Rotorcraft utilization rates are expected to increase at an average annual rate of 0.4 percent over the 13-year forecast period. Utilization rates for experimental and "other" aircraft are expected to grow by 0.7 and 0.5 percent, respectively, over the same time period.

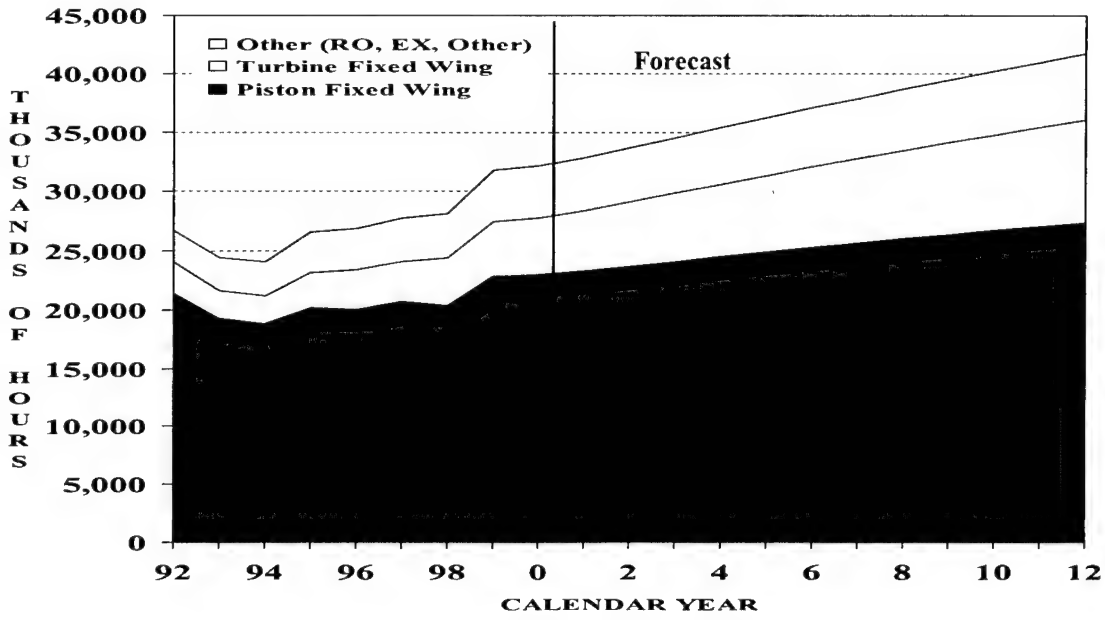


HOURS FLOWN

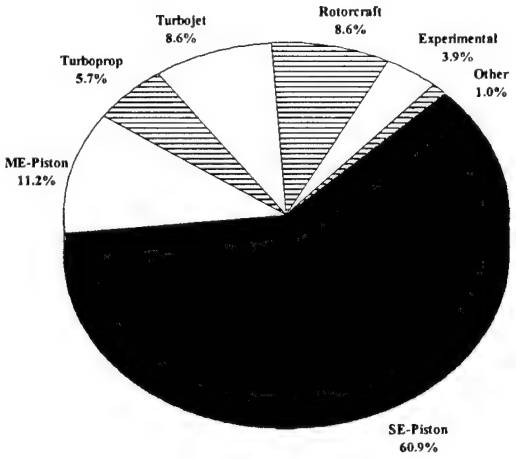
Although the active general aviation fleet is forecast to increase by 0.9 percent annually over the 13-year forecast period, the projected annual increase in hours flown is 2.1 percent. General aviation hours flown is projected to increase from 31.8 million in 1999 to 41.7 million in 2012.

Hours flown for single-engine piston aircraft are forecast to increase from 19.3 million in 1999 to 23.7 million in 2012, an average annual increase of 1.6 percent. This is less than the 2.9 percent growth suggested by the Light General Aviation panel at the FAA/TRB Workshop, which was based on the assumption that student pilots would increase by 8.0 percent annually over the 1999 to 2004 period. Based on actual results for 1999 and 2000--the number of student pilots declined from 97,736 in 1998 to 97,359 in 1999 (down 0.4 percent) and then increased

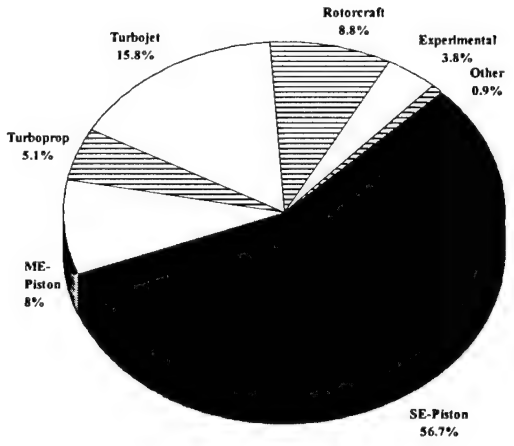
ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



1999



2012

7.0 percent to 104,150 in 2000. Therefore, the panel's projected rates of growth for student pilots and single-engine piston utilization were adjusted accordingly.

Multi-engine piston aircraft hours increase from 3.6 million in 1999 to 3.7 million in 2012, a rate of 0.3 percent annually.

Turboprop aircraft hours flown are projected to increase from 1.8 million in 1999 to 2.1 million in 2012, an annual growth rate of about 1.3 percent. Turbojet hours are expected to increase from 2.7 million in 1999 to almost 6.6 million in 2012, an average annual increase of 7.0 percent.

Rotorcraft hours flown is forecast to increase at an annual rate of 2.3 percent over the 13-year forecast period, from 2.7 to 3.7 million. During the same period, experimental aircraft hours flown are forecast to increase at an annual rate of almost 2.0 percent, reaching 1.6 million in 2012. Hours flown by gliders and lighter-than-air aircraft are projected to increase by 1.4 percent annually.

PILOT POPULATION

The total pilot population is projected to increase from an estimated 648,539 in 2000 to 827,177 by 2012, an annual increase of 2.0 percent over the 13-year forecast period. Annual growth rates for the major general aviation pilot categories are: student pilots, up 2.7 percent annually; private pilots, up 1.4 percent annually; and commercial pilots, up 1.4 percent annually.

While some of the growth of the student pilot population is in response to U.S. economic growth, much of the assumed growth is expected to result from industry-wide programs which are specifically designed to recruit new pilots to general aviation. The growth in numbers of student pilots and certificates issued over the past 5 years suggest that the programs are having a positive impact. The growth in student pilots also assumes growth in pilot training and flight schools which, in turn, implies future growth in the industry. Based on results from the 1999 GA Survey, the number of hours designated as instructional use is up 34.3 percent since 1994.

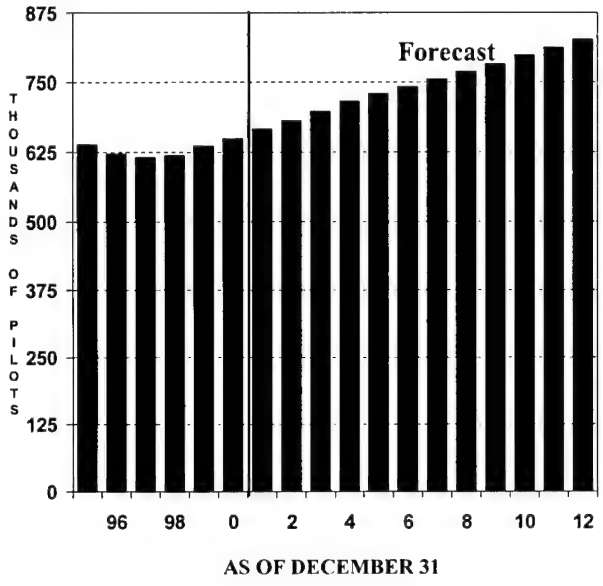
The FAA/TRB panel on Light General Aircraft suggested that the student pilot population would grow by 8 percent annually during the years 1999-2004. While the student pilot forecasts have been revised downward from last year, the forecast still shows steady increases over the 12-year forecast period--from about 104,000 in 2000 to about 144,000 in 2012. While the projected growth is lower than that suggested by the FAA/TRB panel, it is sill meaningful. Higher projected rates for student pilots also result in higher rates for other pilot categories. There is a high correlation between the number of student pilots who move on to the higher pilot classification of private and commercial pilots. AOPA is sponsoring research to develop more rigorous methods for estimating the higher pilot classifications from the numbers of new and renewed student pilot certificates.

Growth rates for the other pilot categories over the 13-year forecast period are: airline transport pilots, up 3.2 percent; recreational, up 1.2 percent; helicopter, up 1.8 percent; and glider, up 0.4 percent.

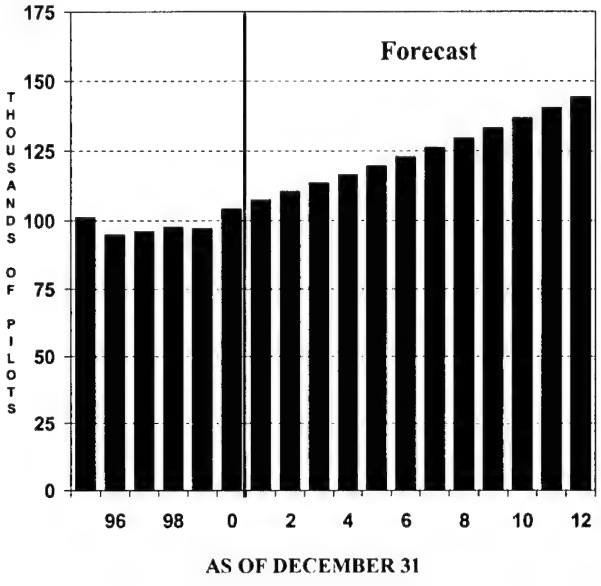
The number of instrument rated pilots is expected to increase from 315,100 in 2000, to 384,100 in 2012, a 1.7 percent average annual rate of growth. In 2000, it is estimated that 48.6 percent of all active pilots were instrument rated. By 2012, the percentage of instrument rated pilots is projected to decline to 46.4 percent. This is largely the result of new entries into the pilot population, e.g., student pilots who do not require an instrument rating.

ACTIVE PILOT TRENDS AND FORECASTS

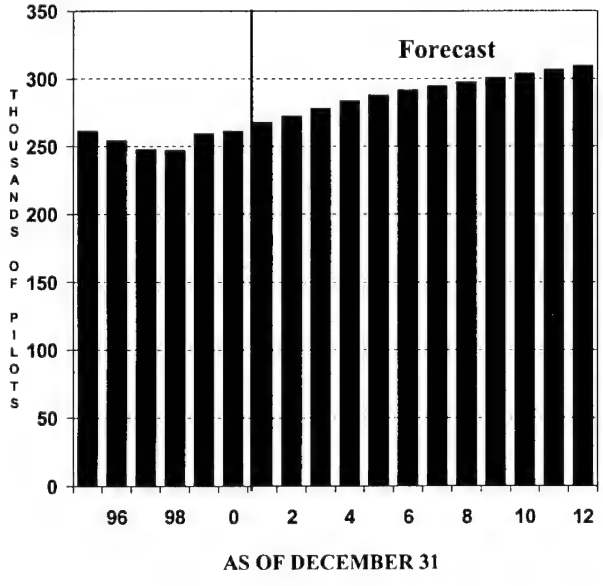
TOTAL



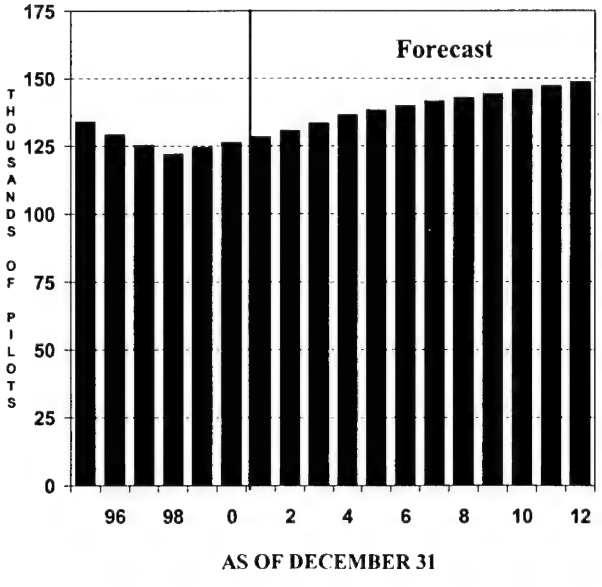
STUDENT



PRIVATE



COMMERCIAL



CHAPTER VI
HELICOPTERS

CHAPTER VI

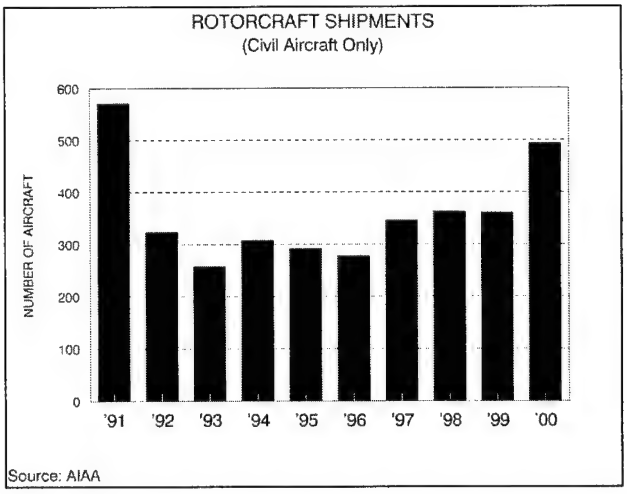
HELICOPTERS

Helicopters participate in a wide and diverse range of aviation activities, all of which are important and contribute to the nation's economy. These activities include sightseeing; agricultural application; law enforcement; fire fighting; personal transportation; emergency medical services; transporting personnel and supplies to offshore oil rigs; traffic reporting; electronic news gathering; corporate or business transportation; and heavy lift for the oil, utility, and lumber industries.

REVIEW OF 1999-2000

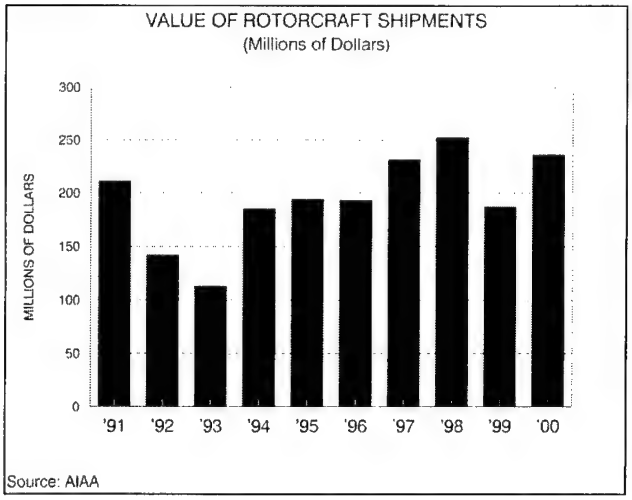
SHIPMENTS

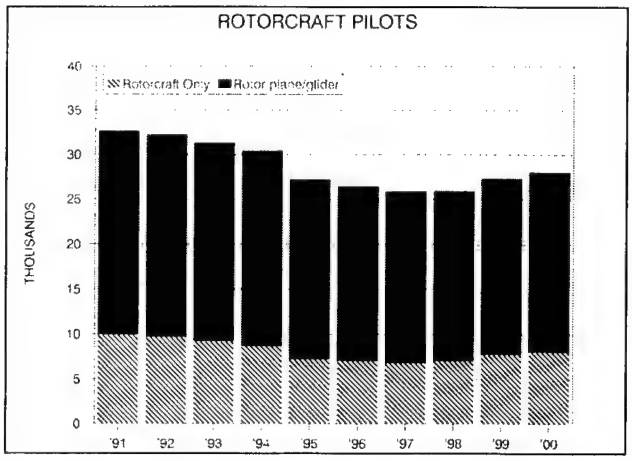
Preliminary data for calendar year 2000 reported by the Aerospace Industries Association of America (AIA)[1] indicate that shipments of new U.S. civil helicopters will total 494 units. Compared to the 361 units shipped in 1999, this represents an increase of 36.8 percent. However, the market for civil helicopters in 2000 is still only 90 percent of what it was in 1991, but considerably more than in any other year since.



The value of the helicopter shipments totaled $236 million in 2000, an increase of 26.2 percent over billings of $187 million in 1999, but still 6.3 percent below the $252 million in billings for 1998. According to AIAA, this large decline is attributable primarily to the decline in shipments of high cost units such as the Sikorsky S-76 and an increase in shipments of piston helicopters manufactured by Robinson. The average value per helicopter shipped has decreased from $694,000 in 1998 to $518,000 in 1999 and further to about $478,000 in 2000.

[1] 2000 Year-End Review and 2001 Forecast—An Analysis, Aerospace Industries Association of America, December 2000.





The AIAA projects an increase in the market for helicopters in 2001. Civil helicopter shipments are forecast to total 502 units in 2001 (up 6.7 percent). The sales value of these aircraft is expected to decline again in 2001 (down 2.5 percent), totaling $230 million. This decline is largely due to larger increases in sales of the less expensive piston-powered helicopters relative to the more expensive turbine rotorcraft.

PILOTS

The total rotorcraft pilot population includes pilots who are certificated to operate only rotorcraft (helicopters and gyrocopters) as well as those that may operate a rotorcraft and an airplane and/or a glider. The total number of rotorcraft pilots has increased from 25,849 in 1998 to 27,337 in 1999 and to 28,000 in 2000--a 2-year increase of 8.3 percent.

The number of pilots who are certificated to fly only rotorcraft also increased—from 6,964 in 1998 to 7,728 in 1999 and to 8,015 in 2000—an increase of 15.1 percent over the 2-year period.

1999 GENERAL AVIATION AND AIR TAXI ACTIVITY SURVEY

The historical rotorcraft active fleet and hours flown discussed in this chapter are derived from the General Aviation and Air Taxi Activity (and Avionics) Survey (GA Survey). As previously explained in Chapter V, this survey is conducted annually by the FAA's Statistics and Forecast Branch. The fleet and hours flown data are estimated using a sample of general aviation aircraft from the FAA Civil Aviation Registry. As in any sample survey, variability can be caused by traditional sampling errors and by non-sampling errors. With small groups such as rotorcraft, the estimates are heavily influenced not only by the number of respondents, but also by who responds. For example, if a large helicopter operator with high utilization rates for a particular aircraft type elects to respond one year but not the next, the effect would be to reduce the activity estimates for that particular aircraft type in the second year. This would occur even if that operator had no change in activity.

The active rotorcraft fleet and hours flown by aircraft type are detailed for the period 1994 to 1994 in Chapter V, Tables V-2 and V-3. The

1999 survey results for active rotorcraft and hours flown are also listed in Chapter X, Table 31. The 1999 survey results for active rotorcraft are reported as December 31, 1999 in the tables. The 1999 survey results for rotorcraft hours flown are reported as calendar year 1999.

FLEET AND HOURS FLOWN

Based on the 1999 Survey, there were 7,448 active civil rotorcraft in the United States, an increase of only 0.3 percent over the 7,426 aircraft reported for 1998. However, this represents a 9.8 percent increase over the 6,785 rotorcraft reported for 1997. In 1999, the estimate of the number of active turbine rotorcraft is 4,884--only three more than the estimate for 1998, but 7.9 percent more than the estimate for 1997. There were 2,564 active piston rotorcraft in 1999, an increase of only 0.7 percent over the 1998 estimate of 2,545, but up 13.5 percent over the 1997 estimate of 2,259.

At the FAA/TRB 11th International Workshop on Future Aviation Activities (held in September 1999), the Vertical Flight Panel expressed the view that the active helicopter fleet is significantly larger than the Survey estimates. The panel believes that the active rotorcraft fleet totaled 11,100 in 1999, nearly 50.0 percent higher than that suggested by the GA Survey. Based on original equipment manufacturers' (OEM's) estimates, the industry believes that the active U.S. turbine helicopter fleet totaled 6,600 in 1999, 35.0 percent greater than the GA Survey estimate. The panel also estimates the active U.S. piston rotorcraft fleet at 4,500 in 1999, over 75.0 percent more than the estimates from the GA Survey. However, the panel's estimate of active helicopters exceeds the 1999 population size (active plus inactive) of 9,953 rotorcraft in the FAA Aircraft Registry.

According to the 1999 GA Survey estimates, rotorcraft flew over 2.7 million hours in 1999, an increase of 17.2 percent over 1998. Turbine rotorcraft hours (2.2 million), which account for nearly 80 percent of total rotorcraft hours, increased 14.4 percent in 1999. Hours flown by piston rotorcraft totaled 556,000, an increase of 29.3 percent over 1998.

In 1999, the rotorcraft fleet flew an average of 368.4 hours per active aircraft—448.0 hours for turbine rotorcraft and 216.8 hours for piston rotorcraft. The data indicate an increase in the average utilization of the helicopter fleet of 53 hours or 16.8 percent. Turbine utilization was up 14.4 percent, while piston utilization increased 28.3 percent. The year-to-year fluctuations in these rates could be caused by the size and/or type of helicopter owners/operators/ businesses responding to the survey in any particular year.

PRIMARY USE OF AIRCRAFT

When measured by hours flown, public use was the leading application (19.7 percent) for rotorcraft, followed by instructional (13.8 percent), air taxi (11.8 percent), medical services (11.0 percent), aerial observation[2] (8.4 percent), and corporate (7.6 percent). For piston powered rotorcraft, the leading uses were instructional flying and aerial application--accounting for 56 percent of all piston hours flown in 1999. The top uses for turbine rotorcraft were public use, air taxi, and medical services--accounting for slightly more than half of the turbine hours flown.

In terms of the number of active helicopters in 1999, the top primary use categories were public use (21.8 percent), personal use (16.2 percent), and instructional flying (11.2 percent). The

[2] Pipeline patrol, traffic reporting, search and rescue, etc., but not owned or leased by a government agency.

leading primary use categories for piston rotorcraft were personal use (34.2 percent), instructional flying (20.5 percent), and aerial application (16.5 percent). The leading uses for turbine helicopters were public use (29.7 percent) and air taxi (12.2 percent). These were followed by corporate (9.5 percent), medical services (8.8 percent), and aerial applications (8.5 percent).

FUEL CONSUMED

In 1999, fuel consumed by rotorcraft was estimated to be 71.6 million gallons, an increase of 13.1 percent over the 1998 level of 63.3 million gallons. The consumption of jet fuel increased to 63.2 million gallons in 1999 compared to 56.8 million in 1998. The use of aviation gasoline was up 29.2 percent in 1999, due largely to the increased number of active piston rotorcraft and hours flown.

FUTURE ISSUES

Issues facing the rotorcraft industry include availability of infrastructure, improved safety image, price-to-performance ratio, the maturing of the offshore oil and air medical markets, and environmental impact. Expanding infrastructure faces both public and local government resistance because of safety and environmental concerns. Even with falling prices and improved operating performance, the demand for rotorcraft could be dampened by the lack of adequate facilities. Helicopters are seen as one option to transporting passengers or cargo from airports into the city or to remote business sites; however, operators often find themselves unable to convince communities that a heliport can be a good neighbor.

TECHNOLOGY

Technological advances could stimulate helicopter usage. The Global Positioning System (GPS) and other free flight enabling technologies offer the promise of freeing all aircraft, including helicopters, to use efficient direct routing to their destinations. These technologies may also enable helicopters to fly routes less noticeable to persons on the ground, increasing community acceptance and further enhancing the utility of helicopter operations.

Another major technological advance is the civil tilt-rotor. The tilt-rotor combines the vertical takeoff and landing capabilities of a helicopter with the speed and range of a turboprop aircraft. The extent to which the potential of this technology can be realized will depend in large part the success of the tilt-rotor in military applications.

The first civilian version of the tilt-rotor, the Bell Agusta BA609, is being developed under a joint venture between Bell Helicopter Textron and Agusta. This version was originally scheduled to make its first flight in 2000, with its first delivery scheduled in 2002. However, these dates appear to have slipped somewhat.

Bell now expects the first flight late in 2001 with certification occurring in 2003. Other technological advances in helicopter production worth noting include substitution of lightweight composite materials for metal construction, rotor technologies with fewer operating parts, advanced avionics, and improvements in direct operating cost. Many of these advances are already being incorporated into fixed-wing general aviation aircraft.

Another technology issue or application involves simultaneous non-interfering rotorcraft operations at fixed-wing airports as a means of increasing airport capacity.

AGGRESSIVE NEW PRODUCT DEVELOPMENT

The mid 1990's witnessed a worldwide resurgence in commercial helicopter start-ups, following a number of years in which a flat market dampened rotorcraft manufacturers' interest in new product development. Rational capital replacement decisions for purchasing new aircraft are heavily influenced by marginal price and performance. Among the new models that have or will lead to early replacement of older light aircraft are the light single engine Bell B407 and Eurocopter EC 120 and the light twin engine Bell B427 and Eurocopter EC 135 models.

Of particular interest to the FAA and the North American helicopter community are the Sikorsky S-92 Helibus and the Bell Agusta BA609 tilt-rotor. The S-92 Helibus is an advanced technology medium lift helicopter with a 19 to 22 passenger capacity. It is based in large part on components of the military H-60 Black Hawk. One of its primary markets is expected to be the offshore oil service market. Other potential markets for the S-92 Helibus include air taxi, air medical, priority freight service, and other commercial applications. Keys to the success of the S-92 will be its cost effectiveness and productivity, which many prospective customers have identified as their highest priorities in the increasingly highly elastic markets for their services. Its success will also depend on Sikorsky's strategy of integrating a number of international partners to share the risks. Success in this area should facilitate entry into overseas markets. Sikorsky originally projected certification of the S-92 for 2001. More recent reports now indicate spring 2002 or late 2002, but some redesign work will likely mean that certification will not occur before 2003.

The Bell Agusta BA609 is a 6 to 9 passenger capacity tilt-rotor aircraft with twice the speed and range of conventional helicopters. Targeted niche markets for the BA609 tilt-rotor will include those currently served by both helicopters and small fixed-wing aircraft, frequently in combination. In the course of market research, some operators of corporate helicopters and fixed-wing turboprop aircraft raised the possibility of replacing both aircraft types with an appropriate tilt-rotor for certain applications. Interest was also reported in the air medical and offshore service markets, both of which currently use a combination of fixed-wing and rotary-wing aircraft for many missions.

While the corporate market is less price sensitive than others, the BA609, like the S-92, will have to achieve its target economics to succeed. At the same time, military applications for both of these civil designs are likely, and any domestic or international military interest would certainly improve the financial viability of these two programs. In any case, certification and introduction of these rotorcraft early in the next decade would impact the forecast both qualitatively, as older aircraft are replaced, and quantitatively, since their economics and performance would tend to stimulate demand.

MARKET FACTORS

Factors positively affecting the demand for helicopters include economic growth, the aging of the rotorcraft fleet, and the availability of new more efficient models. New models stimulate demand due to improvements in performance and cost of operation. Factors that may negatively impact the demand for new products include softness in oil price expectations and/or limitations relating to supporting infrastructure.

According to the FAA/TRB Vertical Flight Panel, strong growth is expected in the next several years for both the corporate/private fleet and the law enforcement fleet. The air medical

market for helicopters is maturing. In the near-term, the air medical helicopter fleet is expected to decline in major metropolitan areas as hospital management becomes increasingly aware and concerned about the cost of these operations. However, this decline may be offset by growth in locations outside major metropolitan areas.

Traditionally, oil prices have had an impact on helicopter activity in the Gulf of Mexico. Based on data collected by the Helicopter Safety Advisory Conference (HSAC), the total helicopter fleet in the Gulf increased by 17.8 percent in 1997 to 636 helicopters. By the end of 1998, however, the helicopter fleet declined slightly to 628 helicopters. The Gulf of Mexico helicopter fleet decreased to 607 at the end of 1999, but has increased slightly to 621 at the end of year 2000 according to data presented at the Transportation Research Board annual meeting held in January 2001.

Government regulation and harmonization initiatives may also influence market demand. Aviation regulations could enlarge or reduce the market for aircraft services, depending on whether particular regulations permit or prohibit operations for which a market demand exists. Harmonization is the process of reducing substantive differences between U.S. regulations and those of other nations. Harmonization of aircraft certification requirements helps open international markets to aircraft manufacturers located in the participating nations.

A rapidly growing segment of general aviation is fractional ownership. Several companies have expressed interest in offering fractional ownership of helicopters and both Bell and Sikorsky are experimenting with test programs. For a variety of reasons, including speed and operating range, fractional ownership of helicopters will need to be configured differently than it is for business jets. It is yet to be seen whether fractional helicopter ownership can capture the attention of potential users, as the programs have in the corporate jet market.

HELICOPTER FORECASTS

The forecasts of the rotorcraft fleet and flight hours discussed in this section are presented in tabular form in Chapter X, Table 31. Many of the assumptions used to develop these forecasts were derived from discussions with industry experts and from reports developed by the Vertical Flight Panel at the September 1999 FAA/TRB Workshop.

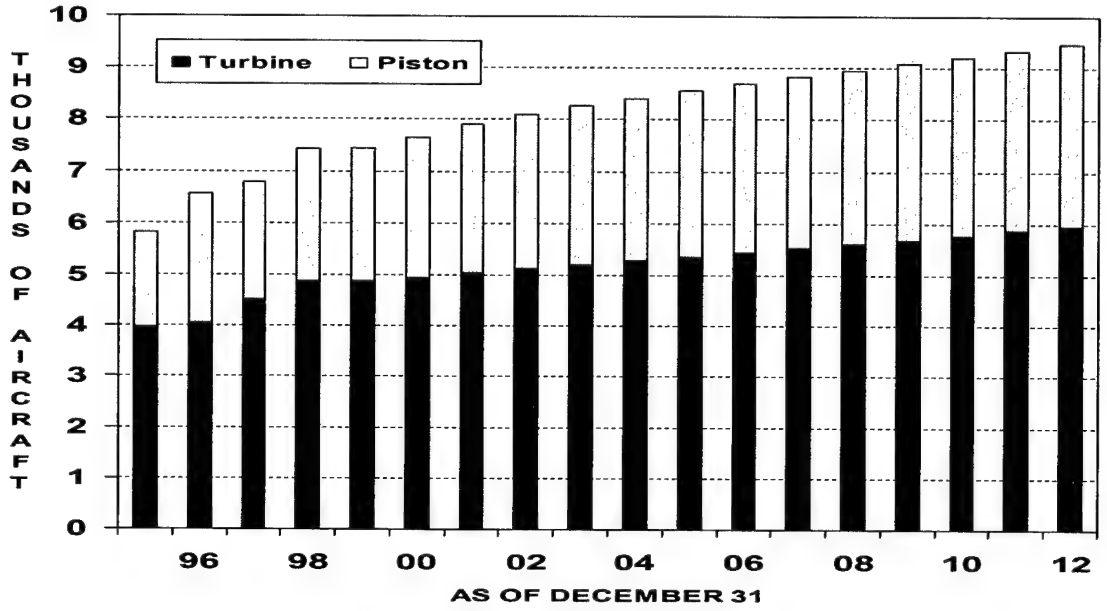
The rotorcraft forecasts for active fleet, utilization rates, hours flown, and fuel consumed use the data obtained from the 1999 GA Survey as the base year. Therefore, the forecast period for these four activity measures extends from 2000 through 2012. References to the average annual growth rates for the forecast period include 13 years--1999 to 2012. Forecasts for certificated pilots are based on 2000 data obtained from the airmen certification records maintained at the FAA Aeronautical Center in Oklahoma City. References to average annual growth rates for pilots include 13 years--1999 to 2012.

ACTIVE FLEET

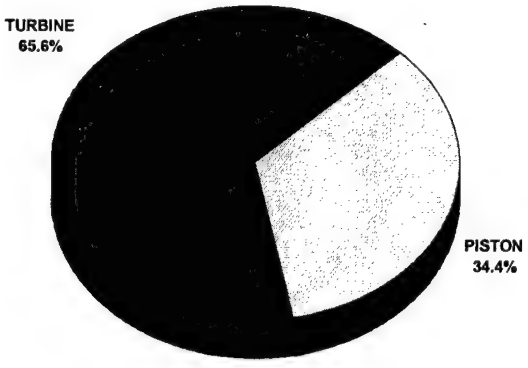
The active rotorcraft fleet is expected to total 9,460 in 2012. Compared to the 7,448 active aircraft in 1999, this represents an average annual increase of about 1.9 percent in the active rotorcraft fleet during the 13-year forecast period.

The number of turbine powered rotorcraft is expected to total 5,960 by 2012. This is an increase of 1,076 rotorcraft over the 1999 level. Turbine powered rotorcraft are expected to account for 63.0 percent of the rotorcraft fleet in 2012, down from 65.6 percent in 1999.

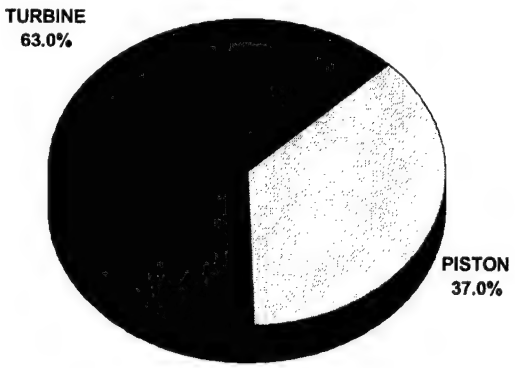
ACTIVE ROTORCRAFT



PERCENT BY AIRCRAFT TYPE



1999

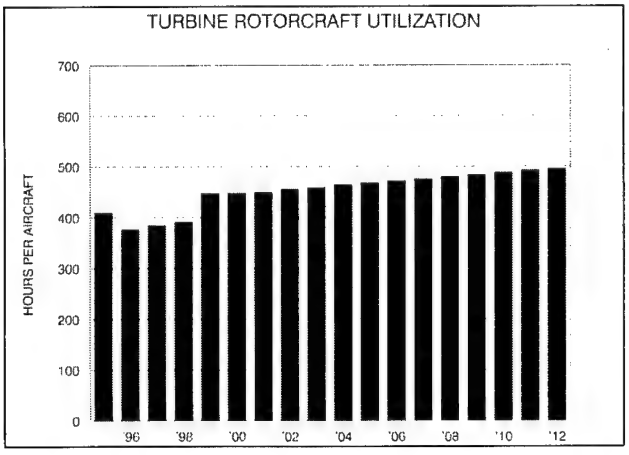


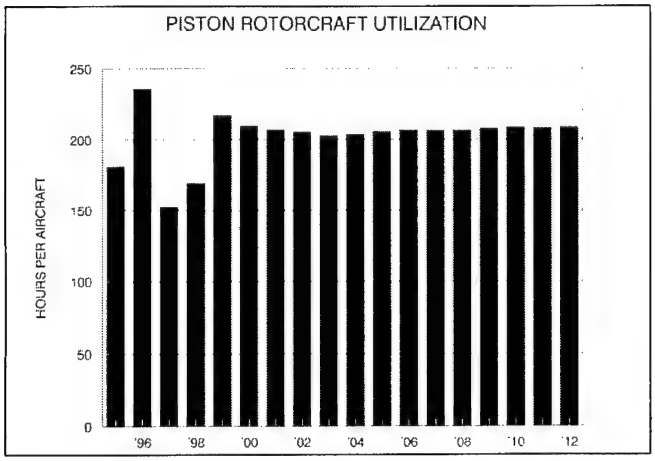
2012

The number of piston powered rotorcraft is expected to increase to 3,500 by 2012. This is an increase of 936 helicopters over the level in 1999. Piston helicopters are expected to account for 37.0 percent of the rotorcraft fleet in 2012.

UTILIZATION

The annual utilization rate for turbine powered helicopters is expected to increase from 448.0 hours in 1999 to 495.8 hours in 2012, an average annual increase of 0.8 percent. Average annual hours for the piston rotorcraft fleet are estimated to decrease from 216.8 hours in 1999 to 208.6 hours in 2012.[3]





[3] The lower utilization rates reflect input obtained from helicopter industry representatives.

FLIGHT HOURS

Growth in the total active fleet, combined with increased utilization rates, are forecast to result in an increase in rotorcraft flight hours from 2.7 million in 1999 to 3.7 million in 2012. This represents an average annual growth rate of 2.3 percent.

Turbine powered rotorcraft flight hours are projected to reach 3.0 million by 2012, an average annual growth rate of 2.3 percent over the 13-year forecast period. Flight hours for the Piston powered rotorcraft flight hours are forecast to total 730,000 hours in 2012, an average annual increase of 2.1 percent.

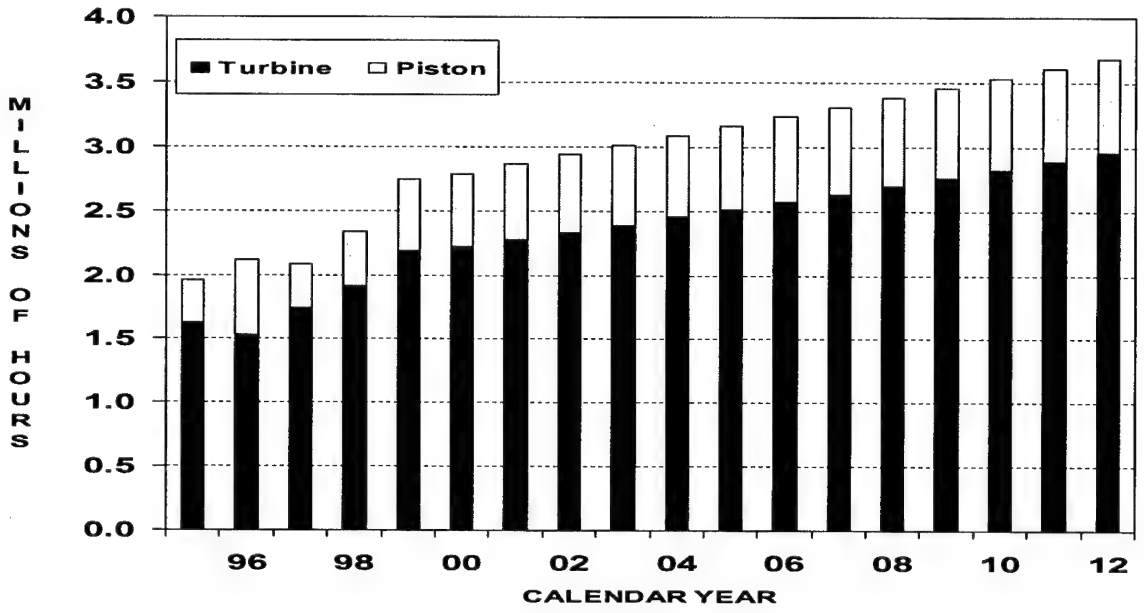
HELICOPTER PILOTS

The number of rotorcraft only pilots is expected to increase at an annual rate of 1.8 percent over the 12-year period, rising from 8,015 in 2000 to 9.890 in 2012. This is below the 2.0 percent annual rate of increase expected for the overall pilot population.

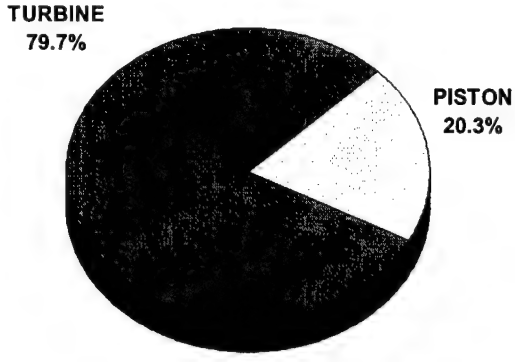
FUEL CONSUMED

Fuel consumption by rotorcraft is projected to total 96.4 million gallons in 2012, 34.6 percent higher than the 1999 level of 71.6 million gallons, an average annual growth rate of 2.3 percent. Fuel consumed by turbine powered helicopters is forecast to reach 85.4 million gallons by 2012, an average annual growth rate of 2.3 percent. Fuel consumed by piston powered helicopters is expected to reach 11.0 million gallons by 2012, an average annual increase of 2.1 percent.

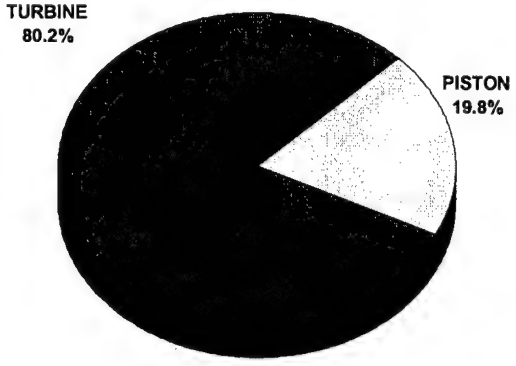
ROTORCRAFT HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



1999



2012

CHAPTER VII

FAA WORKLOAD MEASURES

CHAPTER VII

FAA WORKLOAD MEASURES

The FAA provides the aviation community with three distinct air traffic services: 1) air traffic control tower service at selected airports; 2) traffic surveillance and aircraft separation by air route traffic control centers (ARTCC); and 3) flight planning and pilot briefings at flight service stations (FSS). All four aviation system user groups--air carriers, commuter/air taxi, general aviation, and military--use these FAA operational services to enhance the flow and safety of aviation traffic.

Because the four aviation system user groups differ in the demands they impose on the air traffic system, multiple indicators are used to describe the total FAA operational workload. No single measure typifies past trends or future demand for the services provided by the FAA.

REVIEW OF 2000

During 2000[1] the number of FAA towered airports decreased by 21 to 267, and the number of contract towered airports increased by 26 to 192. Since 1990, the number of FAA towered airports declined by 135, and the number of contract towered airports increased by 189.

The removal of one-third of the airports from FAA air traffic counts makes comparisons to previous year's activity levels difficult, if not impossible. To overcome these discontinuities, the FAA is reporting air traffic activity at FAA and contract tower facilities on both an individual as well as a combined basis. Activity at FAA air route traffic control centers is not affected by the tower conversions.

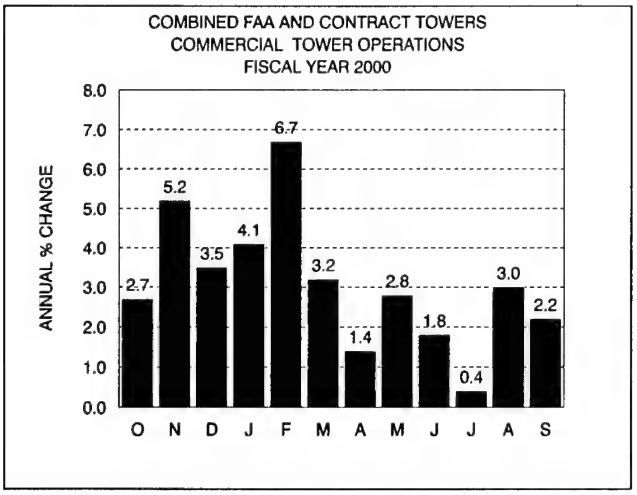
TOWER ACTIVITY

Combined FAA and Contract Towers

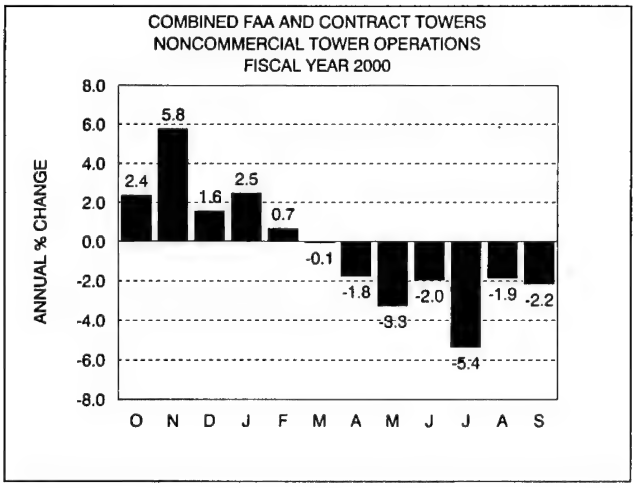
Aircraft activity at the 459 FAA and contract towered airports totaled 68.7 million operations, up 0.8 percent from 1999. In 2000, commercial activity increased 3.0 percent; air carrier operations driven by strong demand were up 3.9 percent, while commuter/air taxi operations increased 1.8 percent. The growth in air carrier operations was diminished somewhat by operational difficulties at United throughout the

[1] All specified years are fiscal years (October through September 30), unless designated otherwise.

summer. It is estimated that cancellations at United lowered the growth in air carrier operations by 0.2 percent in 2000.



Operations by commuter/air taxi increased by 1.7 percent in 2000, to 10.8 million. Much of the growth is the result of commuter code-sharing and schedule tie-in agreements with the larger commercial air carriers. Growth in recent years has also come from air carrier restructuring, and the transfer of low density, short-haul markets to commuters, especially the regional jet operators.



Noncommercial activity (the sum of general aviation and military operations) decreased 0.5 percent in 2000 with declines in both general aviation and military activity. General aviation operations decreased 0.5 percent as itinerant operations fell 0.8 percent while local operations were unchanged from 1999's level. Military activity decreased 1.2 percent with itinerant operations down 0.2 percent and local military activity down 2.2 percent.

FAA Towers

On September 30, 2000, there were 267 FAA towered airports. Aircraft operations at these airports totaled 53.2 million, down 3.4 percent from 1999. Of the four users of the system, only air carrier operations increased during the year, up 3.4 percent. The other users of the system, commuter/air taxi, general aviation, and military were down 1.1, 7.5, and 5.6 percent, respectively.

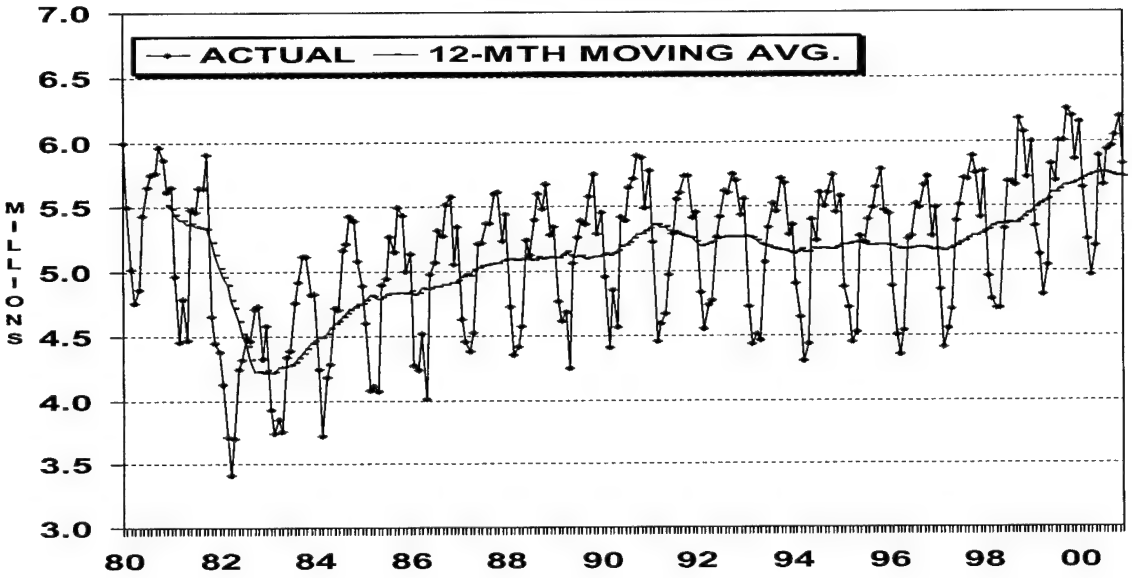
Contract Towers

On September 30, 2000, there were 192 contract towers funded either partially or fully by the FAA. Aircraft activity totaled 15.5 million operations, up 18.6 percent from 1999. Commercial activity increased 25.7 percent, while noncommercial activity expanded 17.7 percent. In 2000 air carrier activity increased 49.7 percent, while commuter/air taxi, general aviation, and military operations increased 22.7, 18.2, and 11.3 percent, respectively. General aviation continues to dominate activity at FAA contract towers, accounting for 83.0 percent of total operations.

Historical monthly operations counts for FAA and contract towered airports (from October 1989 to present), by user group, can be found in the Air Traffic Activity Data System (ATADS) on the internet at: http://www.apo.data.faa.gov/.

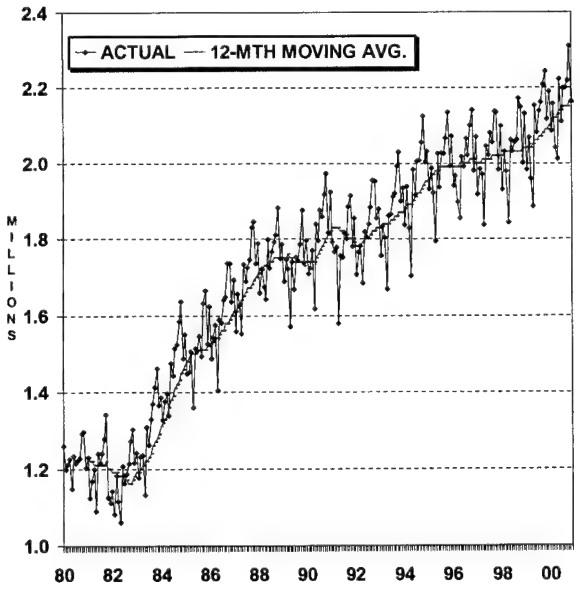
COMBINED FAA AND CONTRACT TOWERS: AIRPORT OPERATIONS

TOTAL OPERATIONS



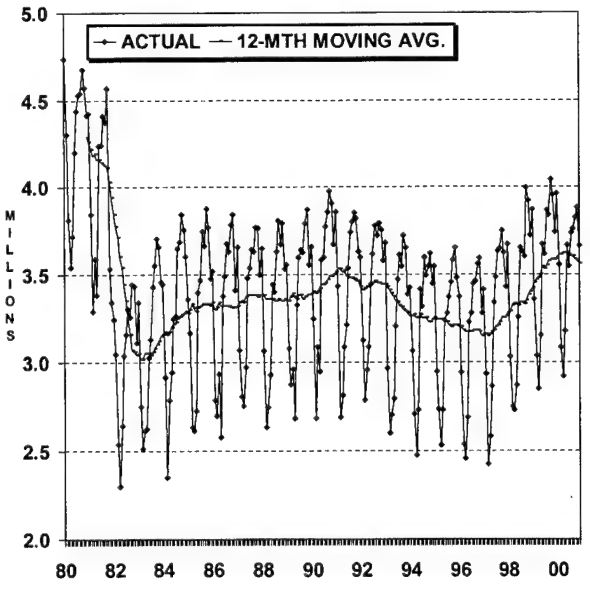
FISCAL YEAR BY MONTH

COMMERCIAL OPERATIONS



FISCAL YEAR BY MONTH

NONCOMMERCIAL OPERATIONS

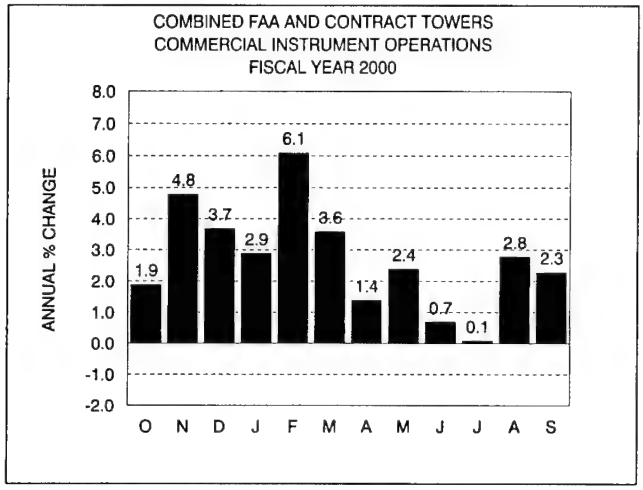


FISCAL YEAR BY MONTH

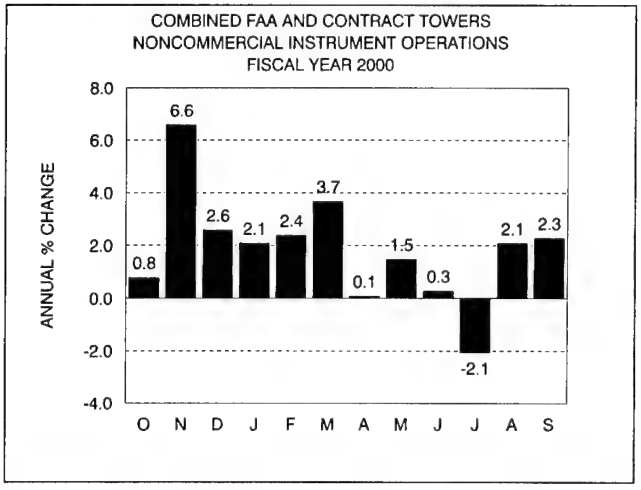
INSTRUMENT OPERATIONS

Combined FAA and Contract Towers

Instrument operations handled at combined FAA and contract towers totaled 53.0 million, up 2.3 percent from the 1999 activity level. In 2000, FAA towers accounted for 98.4 percent of combined total instrument operations.



Commercial instrument operations increased 2.7 percent. Air carrier activity was up 4.4 percent, while commuter/air taxi instrument operations increased 0.3 percent. Since 1990, both commuter/air taxi and air carrier operations have shown relatively strong growth, increasing 22.8 and 18.0 percent, respectively.



Noncommercial instrument operations increased to 24.8 million--up 1.8 percent. General aviation operations expanded 1.8 percent, and in 2000 accounted for over 40 percent of total instrument operations. Military operations increased 1.6 percent, and accounted for only 6.7 percent of the total.

Most of the increase in general aviation activity since 1982--over 50 percent--can be attributed to the formation of radar service areas at 150 locations throughout the United States. Currently, there are 48 terminal radar service areas, 16 class B (terminal control areas) and 86 Class C (airport radar service areas).

FAA Towers

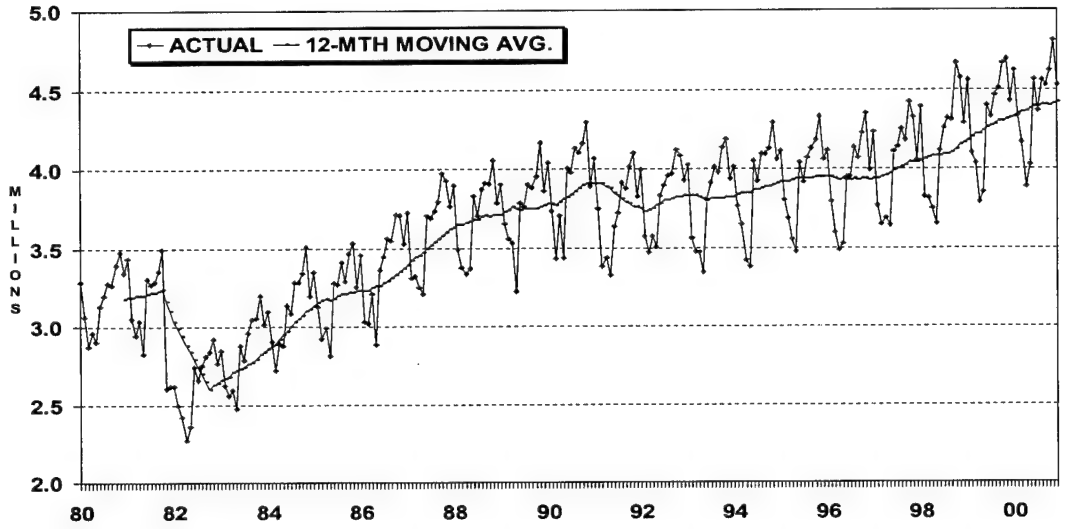
Instrument operations at the 267 FAA towered airports totaled 52.2 million, an increase of 2.0 percent. Commercial activity was up 2.4 percent, while noncommercial operations increased 1.7 percent. In 2000, instrument operations at FAA towers increased for three of the four users of the system. Air carriers, general aviation and the military increased 4.2, 1.7, and 1.5 percent, respectively. Commuter/ air taxi activity decreased slightly, down 0.2 percent.

Contract Towers

Instrument operations at the 192 FAA contract towered airports totaled 844,800, up 17.4 percent from 1999. Commercial activity increased 24.2 percent, while noncommercial activity expanded 8.5 percent. In 2000, air carrier instrument operations at FAA contract towers increased 38.5 percent, while commuter/air taxi increased 20.1 percent. General aviation and military instrument operations expanded 9.1 and 5.8 percent, respectively.

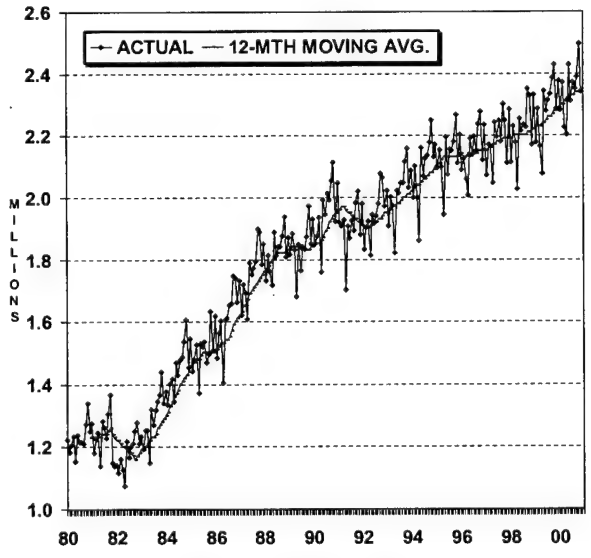
COMBINED FAA AND CONTRACT TOWERS: INSTRUMENT OPERATIONS

TOTAL OPERATIONS



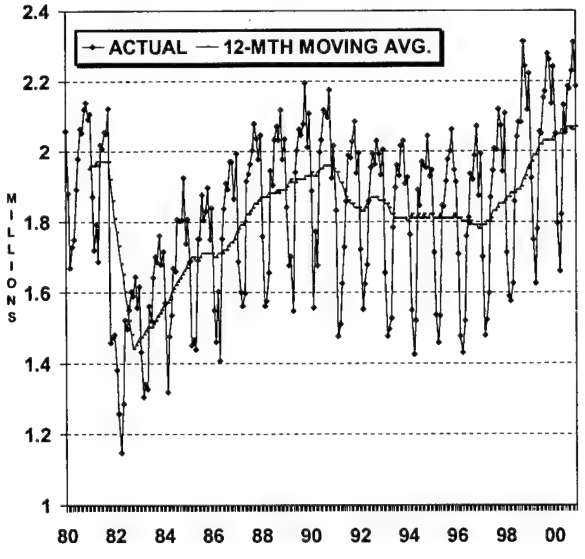
FISCAL YEAR BY MONTH

COMMERCIAL OPERATIONS



FISCAL YEAR BY MONTH

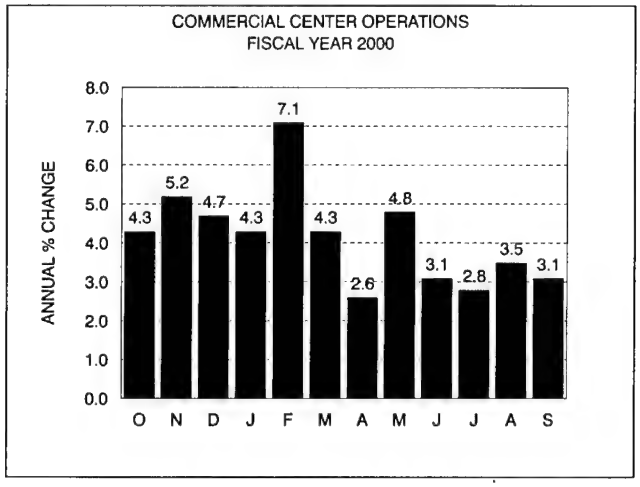
NONCOMMERCIAL OPERATIONS

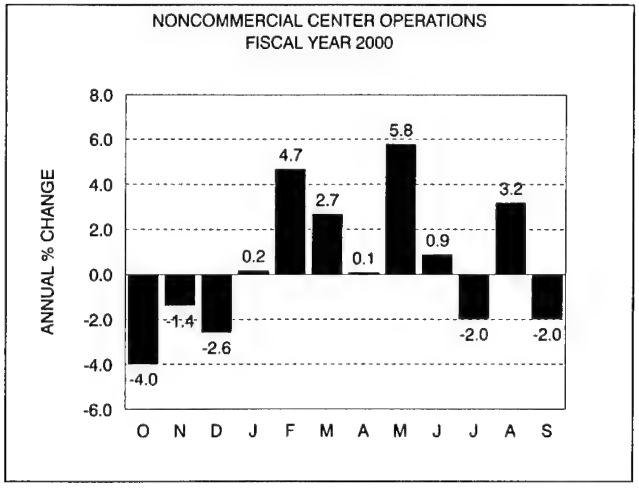


FISCAL YEAR BY MONTH

CENTER ACTIVITY

In 2000, the number of aircraft flying under Instrument Flight Rules (IFR) handled by FAA ARTCCs totaled 46.0 million, an increase of 3.1 percent over 1999 activity counts. The increase at the ARTCCs in the last 5 years (up 14.6 percent) can be attributed to the growth in both commercial aviation activity (up 19.0 percent), and general aviation activity (up 11.8 percent). The number of commercial aircraft handled at the Centers (33.1 million) increased 4.1 percent in 2000. The number of air carrier aircraft handled totaled 25.0 million (up 3.9 percent), while the number of commuter/air taxi aircraft handled totaled 8.1 million (up 4.8 percent).



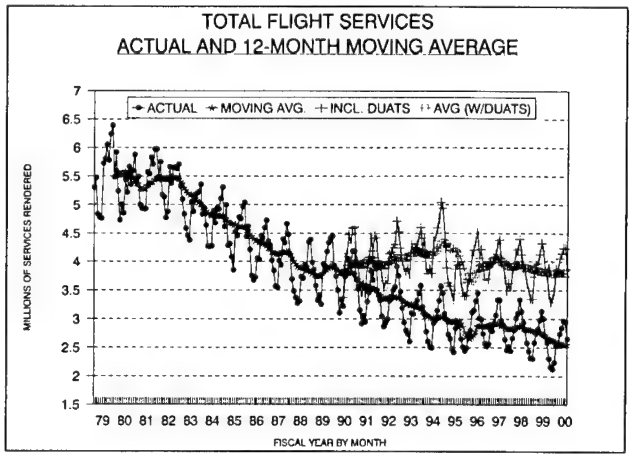


The number of noncommercial aircraft handled (12.9 million) was up 0.5 percent. The number of general aviation aircraft handled totaled 8.7 million (down 0.7 percent), while military activity totaled 4.2 million (up 3.0 percent).

FLIGHT SERVICE STATION ACTIVITY

Total flight services, encompassing pilot briefings, flight plans filed, and aircraft contacts recorded by FAA Flight Service Stations (FSS) totaled 30.5 million in 2000, down 5.9 percent from 1999 activity levels. In 2000, the number of aircraft contacted dropped 3.0 percent to 3.2 million, the number of pilot briefings declined by 7.2 percent to 7.7 million, and the number of flight plans originated declined 5.1 percent to 5.9 million.

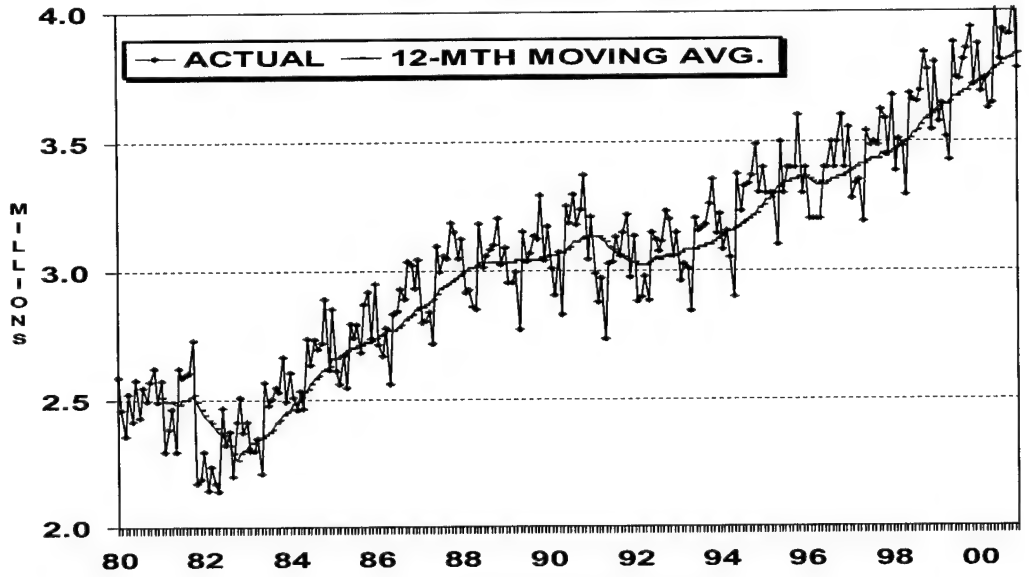
The FAA also provides automated flight services, which supplement FSS activity. The Direct User Access Terminal System (DUATS) provides an alternative to the FSS for obtaining pilot briefing information and filing flight plans. Use of this service was introduced in February 1990.



In 2000, total DUATS transactions (including flight plans) totaled 15.0 million, an increase of 12.2 percent over 1999. The number of flight plans filed through DUATS totaled just under

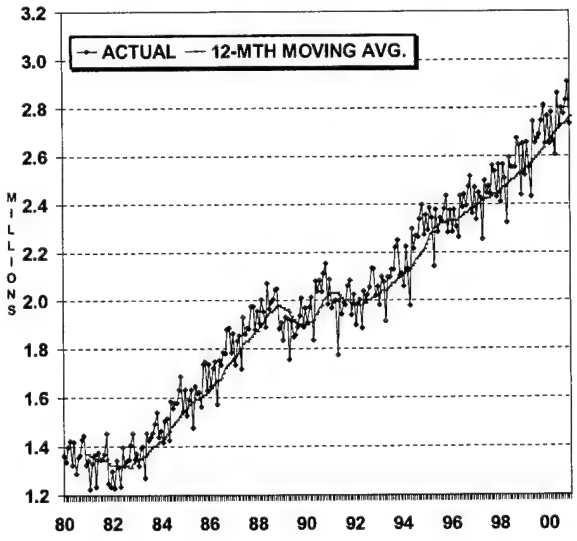
FAA AIR ROUTE TRAFFIC CONTROL CENTERS: IFR AIRCRAFT HANDLED

TOTAL AIRCRAFT HANDLED



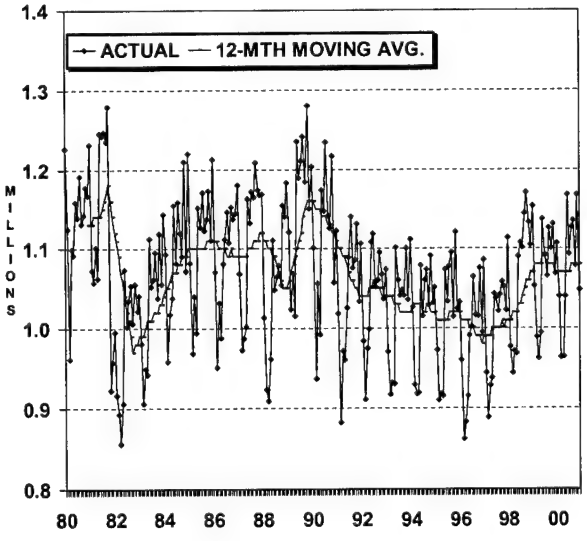
FISCAL YEAR BY MONTH

COMMERCIAL OPERATIONS



FISCAL YEAR BY MONTH

NONCOMMERCIAL OPERATIONS



FISCAL YEAR BY MONTH

799,500, an increase of 10.5 percent from 1999 activity. The number of DUAT transactions increased 12.4 percent in 2000, from 6.0 million in 1999 to 6.7 million.

When these DUAT services are included with traditional FSS services, total flight services decreased from 45.8 million in 1999 to 45.5 million in 2000, a decline of 0.6 percent.

FORECAST ASSUMPTIONS

Forecast growth in FAA workload measures includes not only the demand imposed on the existing National Airspace System, but also aviation activity at new locations not previously provided with FAA services. Workload forecasts are presented for combined FAA and contract towers, and separately for FAA facilities and contract towers.

NUMBER OF FAA FACILITIES

There were 267 FAA towered airports on September 30, 2000. There are 150 radar service areas--48 terminal radar service areas, 16 class B (terminal control areas), and 86 class C (airport radar service areas). The number of FSSs and AFSSs totaled 75 on September 30, 2000: 61 AFSSs and 14 Alaskan rotational FSSs.

In 2001, the number of contract tower airports will increase from 192 to 221 and remain at that level over the remainder of the forecast period. The number of FAA towers is assumed to remain at 267 throughout the 12-year forecast period.

COMMERCIAL AVIATION: RISKS AND UNCERTAINTIES

Although growth in demand for commercial aviation services is based upon continued growth in the U. S. economy, lower industry operating costs, lower fares, lower fuel costs, and financial stability, there is uncertainty associated with these forecasts. A number of economic events could alter the short- and long-term environment, and cause demand to differ substantially from the projections presented in this report. Also, structural changes in the inudstry could change the mix of operations at FAA facilities.

The introduction of state-of-the-art jet aircraft into the regional/commuter fleet could significantly alter the route system of the industry. These new aircraft will enable regional/commuters to greatly expand the number of markets they serve. Should the number of route transfers or new markets greatly exceed current expectations, commuter/air tax operations at FAA facilities could be higher than currently forecast. Conversely, air carrier operations could be lower.

Further, the U.S. airline industry could be entering a new era of consolidation with the proposed merger between United and US Airways and the potential reactions from other carriers. If the structure of the industry were to change as a result of this merger and/or other potential combinations, it is clear that operations at FAA facilities would be greatly impacted.

WORKLOAD FORECASTS

The workload measures for airports with air traffic control towers are the number aircraft

operations (sum of landings and takeoffs) and instrument operations. The workload measure for ARTCCs is the number of aircraft handled (sum of departures, landings, and overflights for aircraft operating under instrument flight rules). For flight service stations, the workload measures are flight plans filed, pilot briefings, and aircraft contacts. The workload measures are developed by user category for all three components of the air traffic control system.

METHODOLOGY

Projections of total operations for commercial air carriers and commuter/air taxis at airports with air traffic control towers are based upon forecasts of Available Seat Miles (ASMs), and assumptions regarding average seats per aircraft and aircraft stage length. Specifically, if the average number of seats per aircraft is divided into the forecast of ASMs, an estimate of the number of aircraft miles in the system is derived. The average aircraft stage length is then divided into the forecast of aircraft miles in order to derive an estimate for departures. For both air carriers and cargo operators, estimates are made for both international and domestic departures. An estimate of total operations for the air carrier and commuter/air taxis is derived by doubling the number of departures. Forecasts of general aviation airport operations are developed from projections of general aviation hours flown and the general aviation fleet.

Forecasts of instrument operations for airports with air traffic control towers, and the workload measures for ARTCCs and flight service stations are derived from the forecasts of airport operations by user category. Military operations above and beyond incremental activity associated with new towers were held constant throughout the forecast period. This approach was taken since significant changes in military aviation activity are generally due to preparation for or the carrying out of military actions abroad, which are unpredictable.

TOWER ACTIVITY

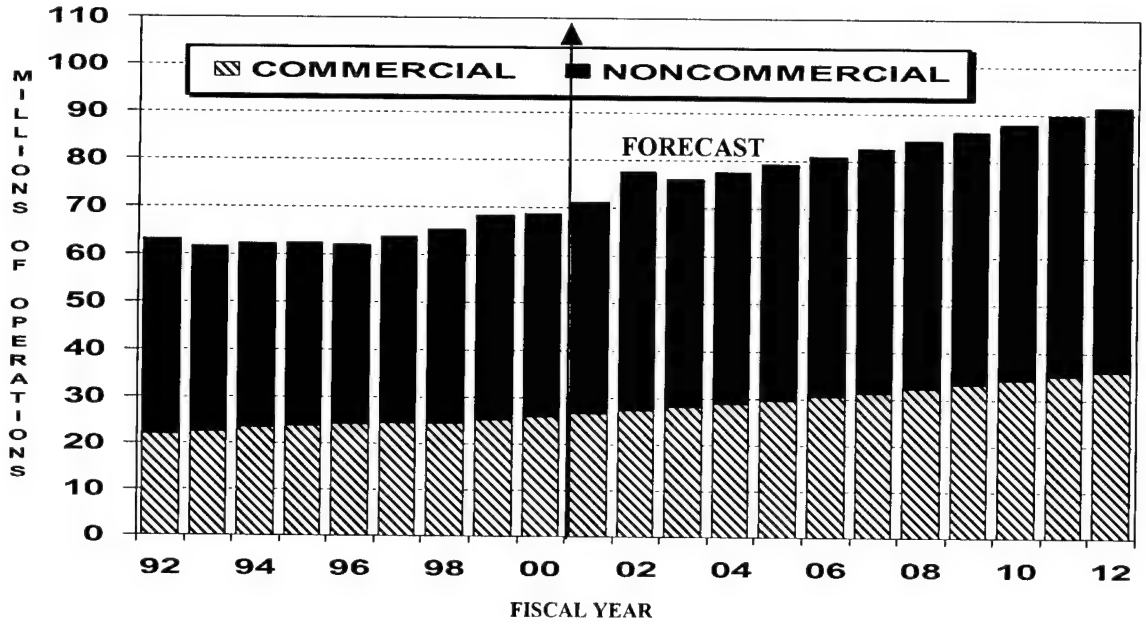
It is assumed that the number of FAA traffic control towers will remain constant at 267 throughout the forecast period. The number of contract towers is expected to increase by 29 to 221 in 2001 and remain at that level over the balance of the forecast period. It is assumed that the 29 new towers will be phased in throughout 2001. As such, the addition of the new towers will heavily impact contract tower operations in both 2001 and 2002.

Combined FAA and Contract Towers

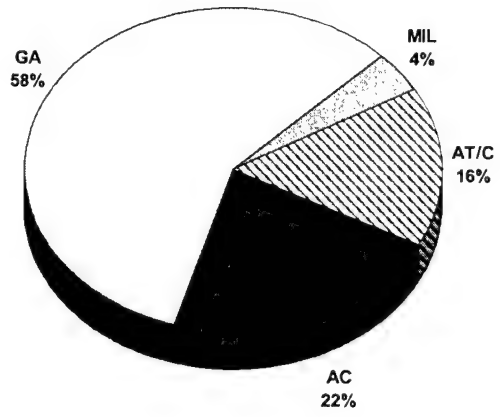
During the 12-year forecast period, operations at FAA and contract towered airports increase to 91.5 million by 2012, averaging 2.4 percent annually. The mix of aircraft using combined FAA and contract towered airports is expected to change only marginally over forecast period since the vast majority of activity at the 29 new contract towers will be at general aviation airports.

Commercial activity is forecast to grow at relatively faster rates than general aviation. Air carrier operations share of the combined towered airport activity increases from 22.1 percent in 2000 to 23.8 percent in 2012. The commuter/air taxi share remains constant at 15.7 percent while general aviation's share of activity declines from 58.0 to 57.0 percent by 2012. Commuter/air taxi activity is projected to grow at rates less than that forecast for the larger commercial air carriers due to the increasing use of larger regional jets and turboprops, longer passenger trips, and higher load factors.

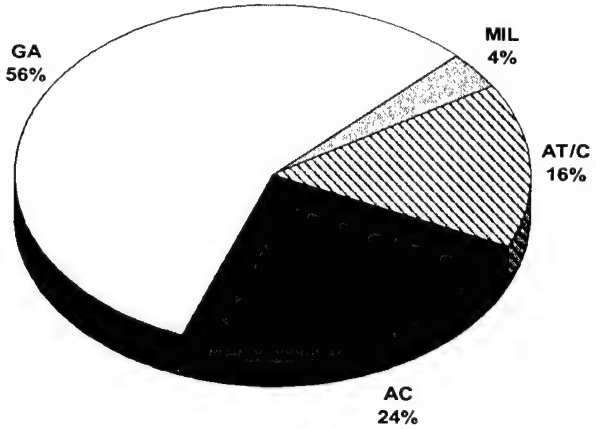
AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



2000



2012

Air carrier operations increase from 15.2 to 21.8 million operations during the 12-year forecast period, a rate of 3.1 percent annually. Commuter/air taxi operations increase from 10.8 to 14.3 million operations (2.4 percent annual growth) while general aviation increases from 39.9 to 52.2 million operations (2.3 percent annual growth). Itinerant general aviation operations are forecast to increase 29.7 percent over the period, and local general aviation operations are projected to increase 32.5 percent over the period. Total military operations are projected to increase to 3.2 million by 2002 and remain at that level throughout the balance of the forecast period.

Commercial aircraft activity at combined towered airports grows an average of 2.8 percent annually during the 12-year forecast period, increasing from 25.9 to 36.1 million. Noncommercial activity increases at an average of 2.2 percent annually, from 42.8 million in 2000 to 55.4 million in 2012.

Forecasts for individual airports are contained in the FAA's Terminal Area Forecast (TAF) and are available at the following website: http://www.apo.data.faa.gov/.

FAA Towers

In 2000, operations at the 267 FAA towered airports totaled 53.2 million. For the 12-year forecast period, operations at FAA towered airports increase 2.2 percent a year. In absolute numbers, towered operations total 68.8 million in 2012.

Commercial aircraft activity at FAA towered airports is projected to grow 2.8 percent annually during the 12-year forecast period, from 24.1 to 33.4 million. Noncommercial activity increases from its current level of 29.0 million to 35.4 million in 2012.

Contract Towers

In 2000, operations at the 192 contract towered airports totaled 15.5 million. The forecast assumes that 29 new contract towers are added in 2001. The vast majority of the increased activity at these towers is general aviation and military activity. During the 12-year forecast period, operations at contract towered airports increase at an annual rate of 3.2 percent, totaling 22.7 million in 2012. Significant growth in contract tower operations will occur in the next two years with the additional activity of the new towers—up 8.0 percent in 2001 and 13.7 percent in 2002. Thereafter growth in contract tower activity will slow considerably, averaging 1.8 percent annually over the remaining 10 years of the forecast period.

Commercial aircraft activity at contract towered airports grows an average of 3.5 percent annually during the 12-year forecast period, increasing from 1.8 million to 2.7 million. Noncommercial activity grows slightly slower, averaging 3.2 percent annually, increasing from 13.7 million in 2000 to 20.0 million in 2012.

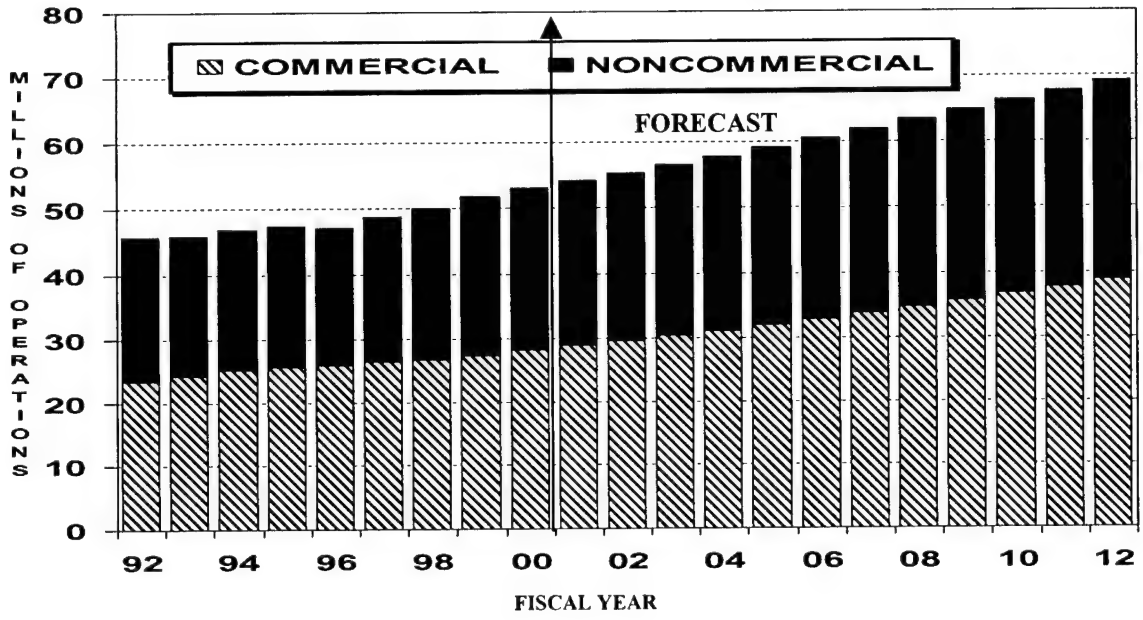
INSTRUMENT OPERATIONS

Combined FAA and Contract Towers

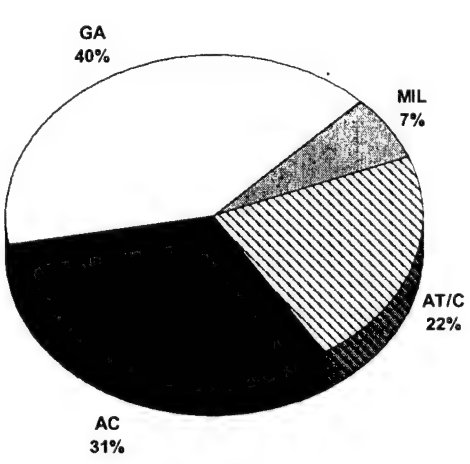
During the forecast period, combined instrument operations increase from 53.0 million operations in 2000 to 69.2 million operations in 2012, averaging 2.2 percent annually. In 2012, FAA towers will account for about 98.4 percent of combined instrument operations.

The mix of instrument operations is expected to change during the forecast period. Air carrier instrument operations increase to 34.2 percent of

INSTRUMENT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



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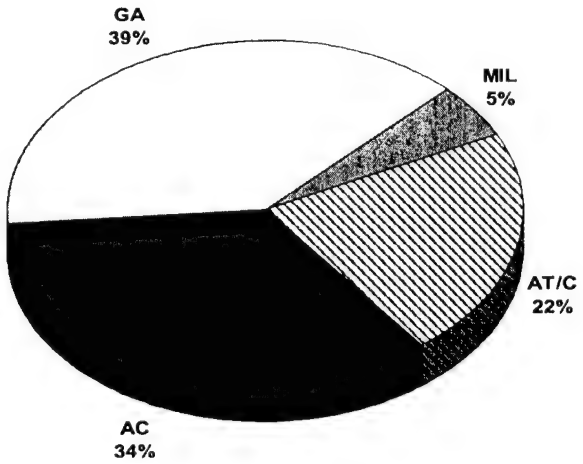


2012

all instrument operations in 2012, up from 31.2 percent in 2000. The commuter/air taxi share remains essentially flat, going from 21.9 to 22.0 percent in 2012, while general aviation's share over the period declines from 40.1 to 38.6 percent.

Air carrier instrument operations are forecast to increase 3.0 percent annually from 16.5 million to 23.7 million by 2012. Commuter/air taxi operations increase from 11.6 million to 15.2 million (2.3 percent annual growth) while general aviation grows 1.9 percent annually, increasing from 21.3 million to 26.7 million operations. Military activity is unchanged at 3.6 million.

During the 12-year forecast period, commercial activity increases 2.7 percent annually, from 28.2 million to 38.9 million. Noncommercial activity is forecast to increase 1.7 percent annually, from 24.8 million in 2000 to 30.3 million in 2012.

FAA Towers

For the 12-year forecast period, instrument operations at FAA towered airports increase an average of 2.3 percent a year. In absolute numbers, FAA towered instrument operations reach 68.1 million in 2012.

Commercial instrument operations at FAA towered airports grow 2.7 percent annually during the 12-year forecast period, increasing from 27.6 million to 38.2 million. Noncommercial activity expands 1.7 percent annually, from 24.5 million in 2000 to 29.9 million in 2012.

Contract Towers

For the 12-year forecast period, instrument operations at contract towered airports increase 2.1 percent a year, totaling 1.1 million in 2012.

Commercial instrument operations at contract towered airports grow at an average annual rate of 2.5 percent during the 12-year forecast period, increasing from 506,100 to 677,100. Noncommercial activity is forecast to increase from 338,700 in 2000 to 410,000 in 2012, growing at an average annual rate of 1.6 percent.

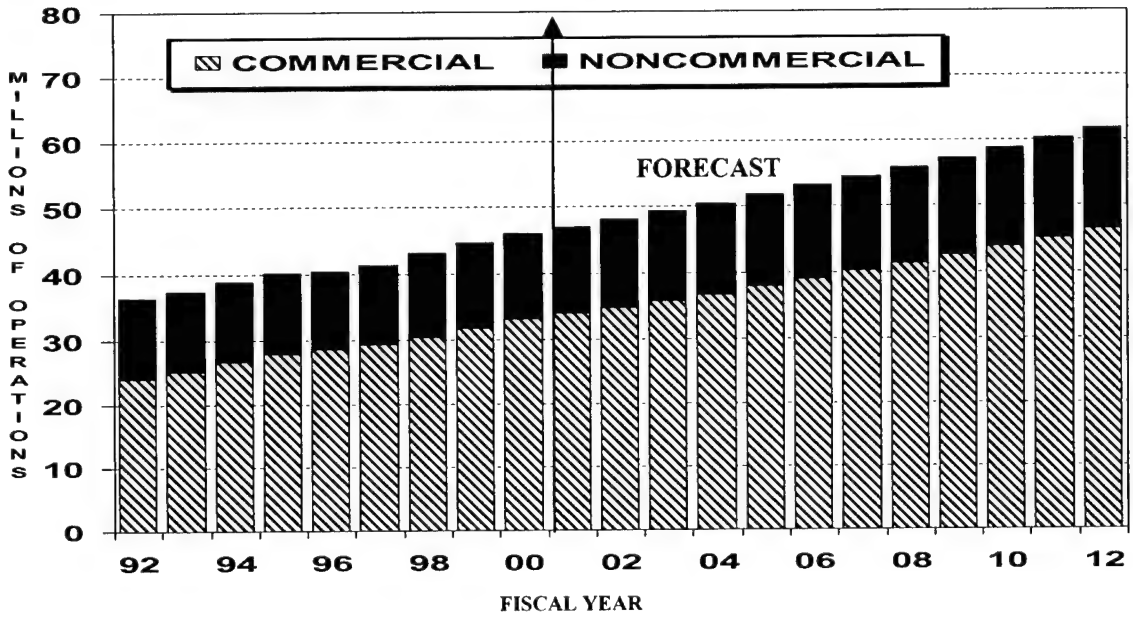
CENTER ACTIVITY

During the 12-year forecast period, the number of aircraft handled at centers increases 2.5 percent annually, expanding from 46.0 million aircraft handled in 2000 to 61.7 million in 2012.

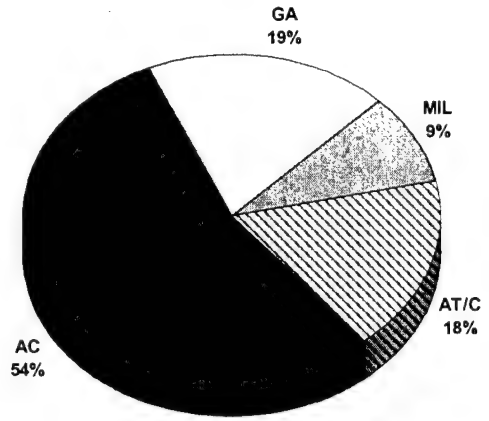
The commercial aircraft activities' share of center workload is forecast to increase from 71.9 percent in 2000 to 75.3 percent in 2012. Between 2000 and the year 2012, the air carrier share is forecast to increase from 54.3 to 58.2 percent. The commuter/air taxi share decreases from 17.6 to 17.2 percent while general aviation's share declines from 19.0 to 17.0 percent.

The number of air carrier aircraft handled at centers is forecast to increase from 25.0 million in 2000 to 35.9 million in 2012, a 3.1 percent annual growth rate. Commuter/air taxi aircraft handled is expected to increase from 8.1 million to 10.6 million (2.3 percent annual growth). General aviation aircraft handled increases from 8.7 million to 11.0 million (1.9 percent annual growth). Military activity remains at 4.2 million throughout the forecast period.

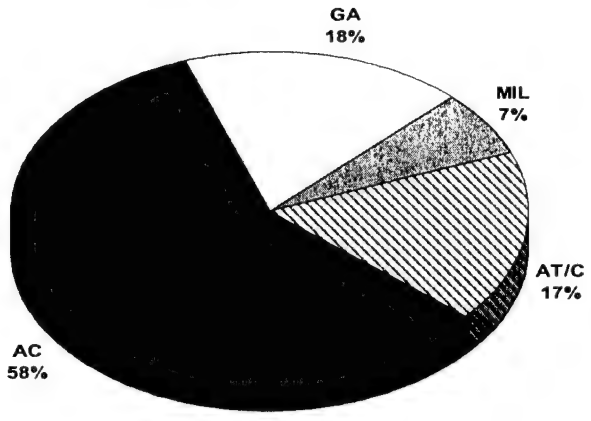
IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



DISTRIBUTION OF WORKLOAD BY USER GROUP



2000



2012

Commercial activity grows at an average annual rate of 2.9 percent during the forecast period, increasing from 33.1 million to 46.5 million. Noncommercial activity increases 1.4 percent annually, increasing from 12.9 million in 2000 to 15.2 million in 2012.

FLIGHT SERVICE STATION ACTIVITY

The introduction of new technology for flight service applications has significantly changed the operating environment of the flight service system. Viewed in the larger context of the total National Airspace System, the recent declining trend in non-automated flight services do not necessarily indicate declining demand for total flight planning services. Rather, they may indicate that demand is being met through increased use of automation and new system capabilities resulting in increased efficiency and productivity.

Non-automated Service

Total traditional (non-automated) flight services originating at FAA flight service stations are projected to decline throughout the forecast period. In absolute numbers, the number of total flight services is expected to decline to 30.4 million in 2001 and to 30.3 million in 2002. By the end of the forecast period, total flight services provided by the FAA flight service stations are projected to total 29.5 million, an average annual decline of 0.3 percent.

The number of pilot briefings are projected to decline slowly throughout the forecast period, declining from 7.7 million in 2000 to just over 7.1 million in 2012, an average annual rate of decline of 0.7 percent.

FSS flight plans originated at flight service stations are projected to increase 0.8 and 0.7 percent during the first 2 years of the forecast period, to a total of 6.0 million in 2002. During the balance of the forecast period, flight plans originated through FAA flight service stations increase at an average annual rate of 0.4 percent. By the year 2012, total flight plans originated are projected to total 6.3 million, a 0.5 percent average annual increase over the 12-year forecast period.

The number of aircraft contacted is forecast to decline from 3.2 million in 2000 to 2.7 million in 2012, a 1.5 percent average annual decline.

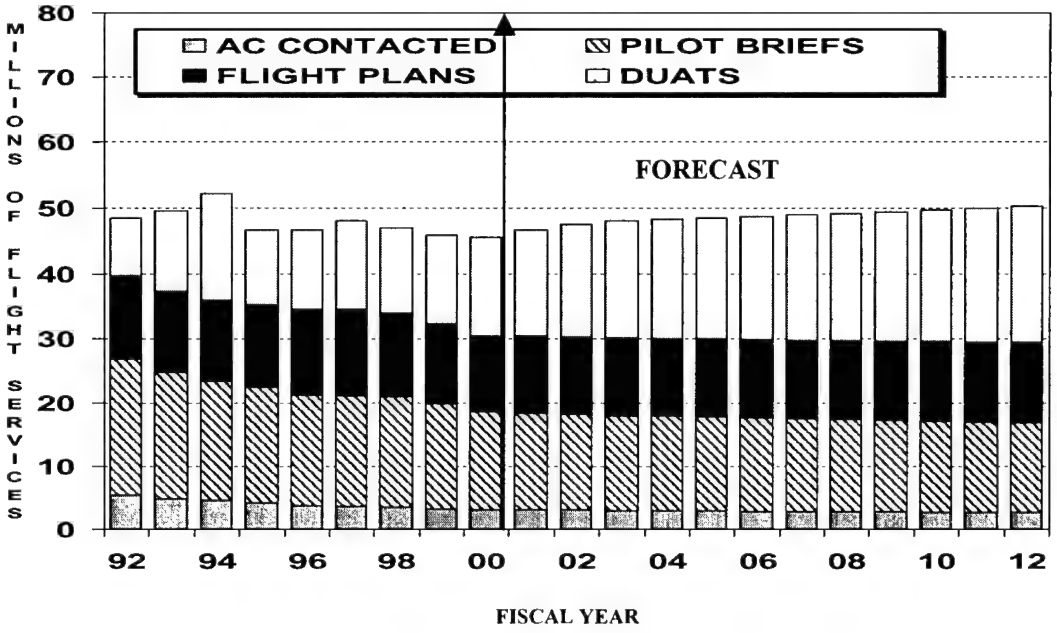
Automated Service

Several factors resulting from automation will tend to dampen the growth in traditional FSS workload measures, as currently defined. First, pilots can now obtain weather briefings through the Telephone Information Briefing System (TIBS), which does not require contact with a flight service specialist, and is not, therefore, included in the FSS pilot briefings count.

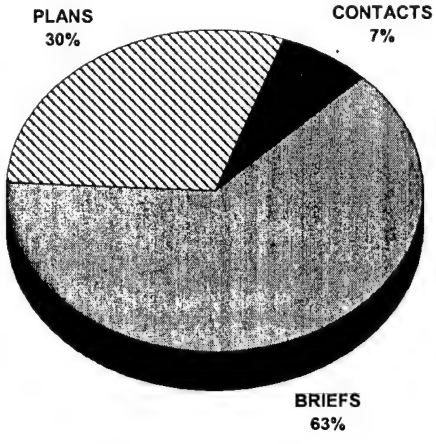
Second, private weather briefing vendors, participating in memorandums of agreement with the FAA, can also provide weather briefings and file flight plans for their customers without going through an FSS. Third, starting February 1990, DUATS became operational. Using DUATS, pilots with access to a computer, modem, and telephone can directly access a national weather data base for weather briefings and flight plan filing without ever going through an FSS.

This automated access may be through the pilot's own computer or through those of fixed-based operators offering the service to their customers. None of the flight planning services provided through the above sources are included in the FSS workload measures.

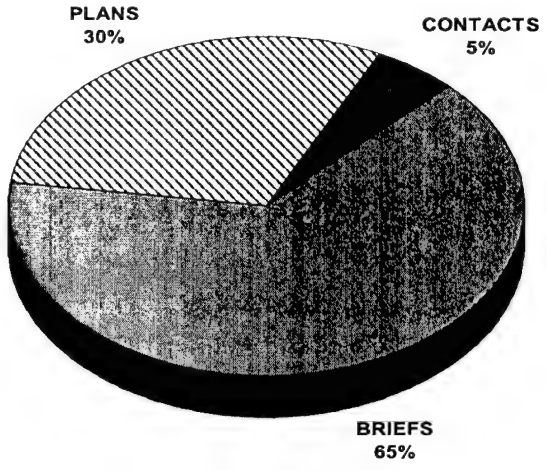
FLIGHT SERVICES ORIGINATED AT FAA FLIGHT SERVICE STATIONS



DISTRIBUTION OF WORKLOAD BY USER GROUP



2000



2012

During 2000, there were a total of 6.7 million DUATS transactions. If each transaction involves a weather briefing, this represents 6.7 million pilot briefs. In addition, approximately 799,500 flight plans were filed through the DUATS system. Using the weighted total flight services formula (two times the sum of pilot briefs and flight plans filed), this translates into approximately 15.0 million total flight services that are not included in the FAA flight service station workload measure.

DUATS transactions are projected to increase from 6.7 million in 2000 to 7.7 million in 2002, up an average 7.0 during the first 2 years of the forecast period. During the period 2000 through 2012, DUATS transactions are forecast to increase at an average annual rate of 2.6 percent, reaching just under 9.2 million in 2012.

For the entire forecast period, flight plans filed through DUATS are expected to increase from approximately 799,500 to just over 1.2 million in 2012, a 3.5 percent average annual increase. By the year 2012, total services provided through DUATS are projected to account for 20.7 million flight services, or 41.3 percent of total system services.

Total Flight Services

The decline in activity at FAA flight service stations since the mid 1980s is the result of the process of FSS consolidation, and the growing acceptance and utilization of DUATS services.

Total flight services, including non-automated and automated services, are expected to total 46.6 million in 2001(up 2.4 percent) and 47.4 million in 2002 (up 1.8 percent). By 2012, total flight services are forecast to reach 50.2 million, an average annual increase of 0.8 percent over the 12-year forecast period.

CHAPTER VIII

FORECAST ACCURACY

CHAPTER VIII

FORECAST ACCURACY

The Federal Aviation Administration (FAA) has developed econometric forecast models and established a forecast process that attempts to anticipate changes that may affect the future direction of the aviation industry. Using this forecast process, the FAA annually provides 12-year forecasts of aviation demand and activity measures, that are, in turn, used for aviation-related personnel and facility planning. The FAA frequently sponsors workshops to critique techniques and practices currently used by the FAA and other aviation forecasters, and to examine the outlook for the aviation industry and its prospects for future growth. The workshops focus on the forecasting process and ways to improve the reliability and utility of forecasting results.

Tables VIII-1 and VIII-2 provide some measure of the accuracy of FAA projections of aviation demand and workloads at FAA facilities. The tables compare forecasts for both short- and long-term periods. The short-term period, 1 to 5 years, is the critical period for personnel planning; the long-term period, 10 years out, is important for facility planning. The two key FAA forecasts are domestic revenue passenger miles (RPMs) and aircraft handled at FAA en route centers, the former used as one of the predictors of the latter.

For short-term trends, forecast errors normally tend to be modest: the 2000 domestic RPM forecast was 2.1 percent lower than the actual results for the year--502.8 billion compared to a forecast of 492.0 billion. Over the last 7 years, the average absolute 1-year RPM forecast error is 1.9 percent. The average 1-year forecast error is 1.3 percent for the 7 years--6 of the forecast years being underestimated and 1 of the forecast years being overestimated.

The forecast for aircraft handled in 2000 was 45.7 million compared to an actual of 46.0 million--resulting in the forecast being 0.7 percent lower than actual. The average absolute 1-year forecast error over the last 7 years is 1.5 percent. The average 1-year forecast error is 1.0 percent, with six out of the last seven forecasts underestimating the number of aircraft handled.

The 10-year out forecast errors tend to be larger because of unanticipated external events that have long-term impacts on the aviation system. Contributing external factors to RPMs may include the 1991 Gulf War and the concomitant rise in fuel prices; the outbreaks of terrorism in 1986 and 1991; the Southeast Asian financial crisis in 1997-98; the Northwest Airline pilot strike in 1998; work slow-downs by pilot unions involved in contract negotiations during 2000; and finally, capacity constraints in the national

TABLE VIII-1

DOMESTIC REVENUE PASSENGER MILES (RPMs) FORECAST EVALUATION

Year Being Forecast	Actual RPMs (Billions)	Forecast RPMs (Billions) Published -- Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1994	371.4	358.6	375.1	375.3	383.1	407.1	397.5
1995	392.6	391.5	374.0	393.9	391.1	404.6	438.7
1996	418.9	405.3	412.2	389.0	411.6	409.1	472.0
1997	440.9	439.5	426.4	432.8	405.7	428.1	514.9
1998	451.5	460.8	459.3	448.6	451.4	422.0	517.9
1999	473.1	464.9	477.8	477.9	465.2	469.5	507.3
2000	502.8	492.0	478.8	495.5	497.3	482.4	506.0
2001		***522.4***	509.7	493.2	514.8	517.5	500.6
2002			***541.2***	527.0	514.4	536.5	513.4
2003				***562.8***	544.9	536.5	504.1
2004					***587.0***	568.4	558.7
2005						***612.9***	574.6
2006							631.4
2010							***757.2***

Year Being Forecast	Forecast RPMs Percent Error Published--Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1994	(3.4)	1.0	1.1	3.2	9.6	7.0
1995	(0.3)	(4.7)	0.3	(0.4)	3.1	11.7
1996	(3.2)	(1.6)	(7.1)	(1.7)	(2.3)	12.7
1997	(0.3)	(3.3)	(1.8)	(8.0)	(2.9)	16.8
1998	2.1	1.7	(0.6)	(0.0)	(6.5)	14.7
1999	(1.7)	1.0	1.0	(1.7)	(0.8)	7.2
2000	(2.1)	(4.8)	(1.4)	(1.1)	(4.1)	0.6

Note on how to read this table: In 1999 the FAA forecast 492.0 billion RPMs would occur in 2000. In fact, 502.8 billion RPMs were recorded, meaning the forecast was 2.1 percent lower than actual.

The 2001 forecast is shown in bold italics.

TABLE VIII-2

FAA ARTCC AIRCRAFT HANDLED FORECAST EVALUATION

Year Being Forecast	Actual Activity (Millions)	Forecast Activity Level (Millions) Published -- Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1994	38.8	37.9	38.4	39.4	41.5	41.9	43.6
1995	40.1	39.8	38.6	39.3	40.3	42.7	43.6
1996	40.4	41.1	40.7	39.4	40.0	41.1	44.0
1997	41.4	40.9	42.2	41.5	40.3	40.7	46.0
1998	43.2	42.0	41.8	43.4	42.4	41.1	46.1
1999	44.7	44.2	42.6	42.5	44.4	43.4	46.0
2000	46.0	45.7	45.2	43.2	43.5	45.3	47.1
2001		***47.0***	46.8	46.2	44.2	44.4	46.6
2002			***48.1***	48.0	47.3	45.2	45.1
2003				***49.3***	49.0	48.4	45.0
2004					***50.4***	50.1	47.3
2005						***51.8***	49.3
2006							48.5
2010							***58.7***

Year Being Forecast	Forecast Activity Percent Error Published--Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1994	(2.3)	(1.0)	1.5	7.0	8.0	12.4
1995	(0.7)	(3.7)	(2.0)	0.5	6.5	8.7
1996	1.7	0.7	(2.5)	(1.0)	1.7	8.9
1997	(1.2)	1.9	0.2	(2.7)	(1.7)	11.1
1998	(2.8)	(3.2)	0.5	(1.9)	(4.9)	6.7
1999	(1.1)	(4.7)	(4.9)	(0.7)	(2.9)	2.9
2000	(0.7)	(1.7)	(6.1)	(5.4)	(1.5)	2.4

Note on how to read this table: In 1999 the FAA forecast 45.7 million aircraft would be handled in 2000. In fact, 46.0 million aircraft were recorded, meaning the forecast was 0.7 percent lower than actual.

The 2001 forecast is shown in bold italics.

airspace system imposed by the infrastructure currently in place. These events, plus the failure of general aviation to respond to the economic recovery of the 1980s and early 1990s, can impact the number of aircraft handled. Since the FAA does not use cyclical economic projections in preparing its long-term forecasts, the 1990/1991 economic recession was not considered in any of the forecasts prepared prior to 1990. For the 7-year period 1994 through 2000, the average 10-year forecast error for domestic RPMs is 10.1 percent, and the average 10-year forecast error for aircraft handled is 7.6 percent.

The evaluation of forecasts published in 1991 for 2000 indicates forecast errors for domestic RPMs and aircraft handled are at their lowest levels in 10 years. For domestic RPMs, the 10-year forecast error was only 0.6 percent. For aircraft handled, the 10-year forecast error was 2.4 percent. The U.S. economy, now in its longest post-war expansion, has experienced only minor interruptions in the past 10 years. The relatively low forecast error exhibited for this 10-year period validates the accuracy of the models used to predict these two key data series. In addition, this statistical comparison highlights the significant impact that unanticipated exogenous events, or their lack thereof, can have on the long-term accuracy of the forecasts.

THE FAA AVIATION FORECASTING PROCESS

INTRODUCTION

The FAA's forecasting process is a continuous and interactive one that involves the FAA Statistics and Forecast Branch, as well as other FAA offices, government agencies, and aviation industry groups. In addition, the process uses various economic and aviation databases, econometric models and equations, and other analytical techniques.

Forecasting aviation activity is an essential component of the FAA's planning process. The forecasts are used to determine staffing levels and capital expenditures required to accommodate the growth of aviation activity while maintaining a safe, efficient environment. The forecasts are also used for short-term budget preparation as well as cost-benefit and regulatory analyses.

The relative importance of the forecasting function in the planning process can be gauged by examining the National Airspace System (NAS) Architecture. The NAS architecture is a 15-year plan, with the first 5 years focusing on the Capital Investment Plan (CIP). The CIP identifies the short-term requirements for sustaining and improving the marginal capacity in the NAS. The sizable investments being made in the National Airspace System make it essential for the FAA to develop and use the most accurate and reliable forecasts possible. Thus, the periodic review and evaluation of the forecasting procedures, models, assumptions, and results constitute essential parts of the process.

The FAA must consider over 100 variables when producing a set of national forecasts. (This number does not include derived subtotals and totals.) Of these, three economic independent variables are obtained from sources external to the FAA. Consequently, the FAA has no control over these truly exogenous variables. There are 12 quantifiable air carrier forecast assumptions and 3 quantifiable regional/ commuter carrier forecast assumptions. These forecast assumptions are made by the FAA analysts who develop the forecast. There are 83 aviation variables that are not FAA workload measures, but influence the workload measures in one way or another. Finally, there are 30 aviation variables that are workload measures used by the FAA for policy

and planning considerations, and for personnel and investment planning.

The table at the end of this chapter contains a list of the variables, the sources of the data, and their relationship to the forecast process. Forecasts of the economic variables are developed outside the FAA. All other forecasts are developed by the FAA.

Research undertaken in the early- and mid-1970s indicated that some measures of economic activity (such as gross domestic product or total employment) and some measures of prices (for example, aircraft prices and aviation fuel prices) were useful predictors of aviation activity. Some unique events (including the failure of U.S. air carriers to follow rational pricing policies; e.g., the destructive fare wars of 1986 and 1992; and the prolonged depressed state of the general aviation manufacturing industry) have altered the relationships between key aviation variables and the economic variables used previously. It has been difficult, therefore, to produce economic or econometric models that predict aviation activity with the same degree of reliability as the models developed in earlier periods. Thus, for the present, the forecasters must rely to a greater degree on subjective judgment, evaluation, and expertise than was required previously. This is not at all unusual in times when significant structural changes are taking place in a volatile industry.

THE FAA FORECASTING PROCESS

The FAA forecasting process is an interactive system that combines econometric and time-series model results with aviation industry forecasts, expert opinions, and anticipated policy impacts to derive a set of FAA aviation forecasts that are used in the FAA decision making process. The flow diagram on page VIII-6 shows a generalized version of the FAA aviation forecasting process.

The first step in developing the forecasts is to enter selected economic and demographic variables into a set of econometric models or equations that represent a simplified version of the real world. The degree of accuracy of the forecasts of aviation activities depends on both the accuracy of the forecasts of the independent variables and the ability of the models to portray activities in the real world.

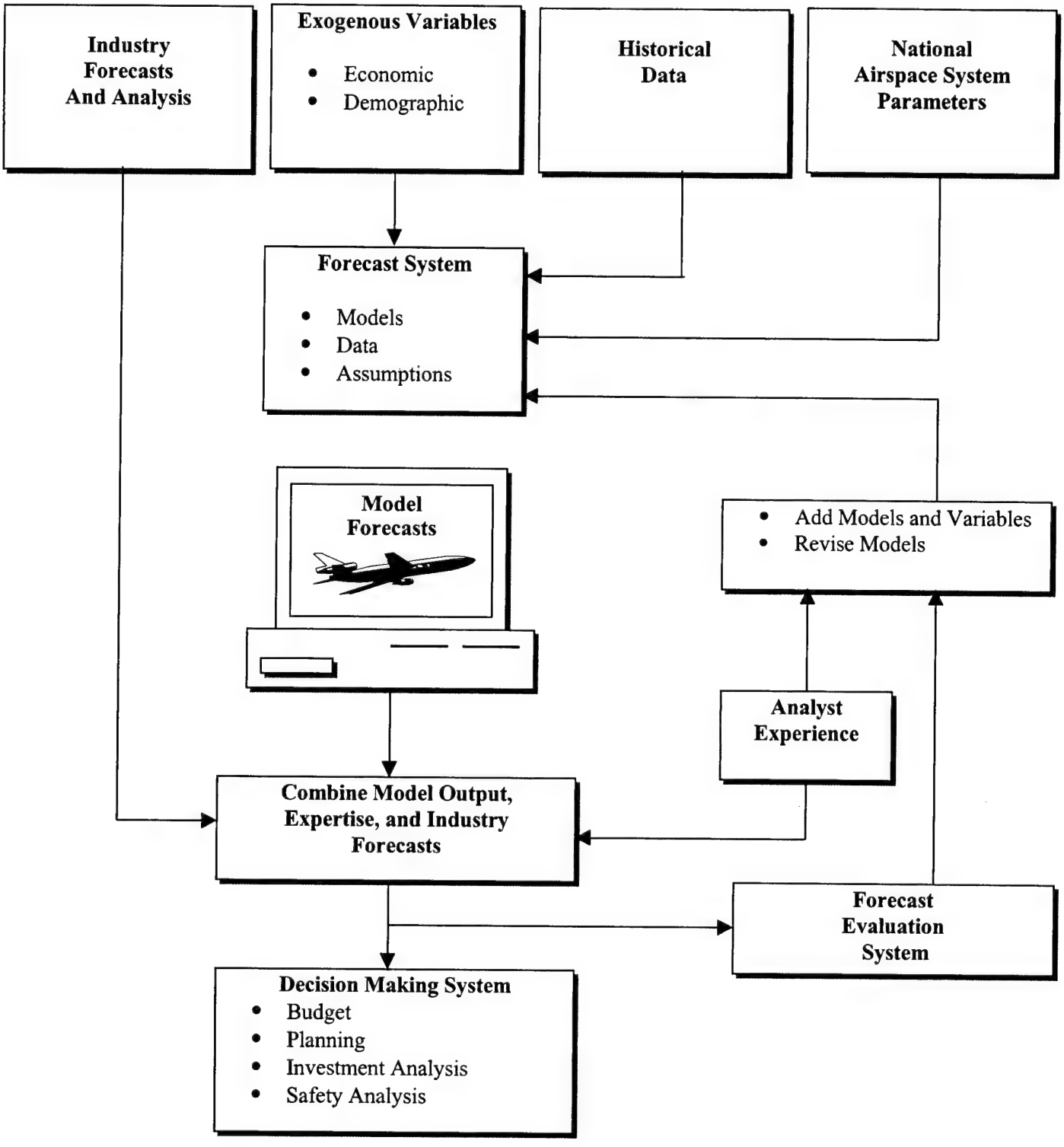
The mechanical execution of forecast models is only the first step in producing a set of forecasts. In general, these models and equations are simple portrayals of a complex system. They cannot account for a number of political, social, psychological, and economic variables, and for all the interrelated actions and reactions that eventually lead to a particular set of results. Therefore, the initial model results are reviewed, revised, and adjusted to reflect the analysts' best judgment of the impacts of the events occurring, or expected to occur, during the forecast period.

FORECAST EVALUATION

It is important to evaluate the forecast results and to determine the causes of the deviations of the forecast values from the actual values observed in the real world. Large forecast errors can lead to inefficient allocation of resources which, in turn, could lead to capacity constraints and delays or to excess capacity in the National Airspace System. For this reason, the FAA continuously evaluates the forecasting process and its results.

The analysis of the errors generally identifies the causes of the deviations and helps determine the proportion due to improper model specifications, erroneous forecasts of independent variables, erroneous forecast assumptions, or incorrect judgments and opinions. If

FAA FORECASTING SYTEM



warranted, the forecast error analysis may lead to a reformulation of the model and to additions or deletions of independent variables, revisions of forecast assumptions, and/or changes in analysts' opinions and judgments about future events.

The evaluation of the forecast process proceeds on several fronts. On a monthly basis, the FAA tracks its short-term forecasts of commercial air carrier traffic (enplanements and RPMs), aircraft operations, instrument operations, IFR aircraft handled, and flight services vis-à-vis the actual counts at the facilities. This tracking system alerts FAA management to unexpected deviations from the trends suggested by the forecasts. Inquiries are then initiated to determine the cause(s) of the differences and revised short-term forecasts may be generated, if necessary.

To help the analysts make correct decisions and informed judgments when developing the forecast assumptions, the FAA meets with industry representatives to discuss industry trends, recent developments, and possible future courses of events. Every 2 years, for example, in cooperation with the National Academy of Sciences, Transportation Research Board (TRB), the FAA sponsors an International Workshop on Future Aviation Activities--"Forecast Assumptions Workshop." This "by invitation only" workshop is attended by some 100 industry planners and forecasters representing airlines, aircraft manufacturers, engine manufacturers, trade associations, academic institutions, and other industry groups.

The participants at the 11th FAA/TRB workshop held September 15-17, 1999, were divided into nine concurrent panels to discuss sectoral trends and problems in the following areas: (1) domestic air carriers, (2) international air carriers, (3) regional and commuter airlines, (4) air cargo, (5) airports and infrastructure, (6) commercial aircraft fleets, (7) light personal and general aviation, (8) business aviation, and (9) vertical flight (rotorcraft).

These subgroups were instructed to critique the current FAA aviation forecasts for their specific areas. Each subgroup was asked to identify specific assumptions about the short- and long-term future trends of the economic and aviation variables that are important to their segments of the industry, to indicate why these trends are considered important, and to explain why specific trends are anticipated. After discussing the current FAA forecast and the group's assumptions, each group attempts to reach a consensus about the key variables affecting the industry and the most likely future courses of these variables. Finally, the TRB publishes a report of the workshop's findings. The participants' benefit from the discussions and the FAA analysts have the TRB workshop report as a benchmark to use in preparing future aviation forecasts, and for evaluating forecasts prepared by other organizations.

Many of the relevant assumptions developed at the 11th FAA/TRB workshop were incorporated into the FAA forecasting system. Specifically, assumptions and forecasts prepared by the industry panels on Light General Aviation, Business Aviation, and Vertical Flight are used extensively in preparing the general aviation and helicopter forecasts. The 12th International Workshop on Future Aviation Activities is scheduled to be held on September 12-14, 2001, in Washington, DC.

Formal and informal meetings with individuals and representatives of specific aviation groups is another method used by the FAA to solicit input and comments on FAA forecasts. Meetings are held regularly with aircraft manufacturers, and with members of the Air Transport Association, General Aviation Manufacturers Association, National Business Aviation Association, Aircraft Owners and Pilots Association, Helicopter Association International, and other general aviation organizations. In addition, FAA analysts maintain one-on-one contact with industry representatives.

The largest setting for industry dialogue and critique regarding the FAA aviation forecast process is the annual FAA Aerospace Forecast Conference. Now in its 26th year, the conference is used to release the forecast results for the upcoming 12 years. The last conference, held March 7-8, 2000, in Washington, DC, combined the commercial and general aviation forecast conferences for the first time in 10 years. Due to a resurgence in the demand for general aviation products and services, it was determined that an expanded national forum for discussing problems and issues facing this industry would be beneficial. Participants and attendees were over 500 strong and included airline and airport executives, aircraft and engine manufacturers, trade associations, aviation consultants, consumer groups, industry representatives, and the news media. To the maximum extent possible, the FAA responds to questions raised about the forecasts both during and after the conference.

An important part of the conference is the opportunity for various leaders and experts in the aviation industry to make technical presentations on a variety of topics of interest to the aviation community. The FAA also receives valuable information and insights through the papers presented at the forecast conference. Last year's conference proceedings were published on the Internet and made available, by request, on CD.

Finally, the FAA requests FAA regional and state participation in the forecast process. For example, the aircraft handled and terminal area forecasts are distributed to FAA regions for review and comment. The comments and changes are incorporated in final facility-level reports. In the case of terminal area forecasts, the FAA regions can make changes directly on personal computers. However, the final facility-level forecasts derived by this procedure must be consistent with the national forecasts.

Periodically, the FAA prepares technical reports comparing forecast accuracy of key workload measures with forecast accuracy of economic variables prepared by the major forecasting services. Based on the results of these studies, the FAA forecasts compare favorably with those produced by the major forecasting services.

TABLE VIII-3

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
ECONOMIC	
ECONOMIC ASSUMPTIONS	
Gross Domestic Product (GDP)	OMB, CBO, DRI, WEFA
Consumer Price Index (CPIU)	OMB, CBO, DRI, WEFA
Oil and Gas Deflator	OMB, DRI, WEFA
AIR CARRIER	
FORECAST ASSUMPTIONS	
Domestic Operations	
Average seats per aircraft	BTS/computed
Average passenger trip length	BTS/computed
Revenue per passenger mile (current $)	BTS/computed
Revenue per passenger mile (2000 $)	Computed
Average jet fuel prices (current $)	BTS/computed
Average jet fuel prices (2000 $)	Computed
International Operations (U.S. Carriers)	
(Same as Domestic)	(Same)
SCHEDULED PASSENGER TRAFFIC	
Domestic	
Revenue passenger miles (RPMs)	BTS
Revenue passenger enplanements	BTS
Available seat miles	BTS
Load factors	Computed
International (U.S. Carriers)	
Revenue passenger miles by World Regions	BTS
Revenue passenger enplanements by World Regions	BTS
Available seat miles by World Region	BTS
Load factors	Computed

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
AIR CARRIER (CONTINUED)	
SCHEDULED PASSENGER TRAFFIC (CONTINUED)	
International (U.S. and Foreign Flag Carriers)	
Passenger enplanements	INS
FLEET	
Large jet aircraft	FAA/AFS-620
HOURS FLOWN BY EQUIPMENT TYPE	
Large jet aircraft	BTS
FUEL CONSUMED	
Jet	
Domestic air carriers	BTS
International air carriers	BTS
General aviation	FAA/APO-110
Aviation Gasoline	FAA/APO-110
REGIONAL/COMMUTER	
FORECAST ASSUMPTIONS	
Average seats per aircraft	BTS/Computed
Average passenger trip length (48 States and Hawaii, Puerto Rico, Virgin Islands)	BTS/Computed
Average load factor	BTS/Computed
PASSENGER TRAFFIC	
Revenue passenger enplanements (48 States and Hawaii, Puerto Rico, Virgin Islands)	BTS
Revenue passenger miles (48 States and Hawaii, Puerto Rico, Virgin Islands)	BTS

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
REGIONAL/COMMUTER (CONTINUED)	
FLEET	
Aircraft less than 60 seats	FAA
HOURS FLOWN	
Total for all passenger airlines	BTS
GENERAL AVIATION	
FLEET	
Active aircraft by equipment type	FAA/APO-110
NUMBER OF AIRCRAFT BY REGION	
Total aircraft in each of nine FAA Regions	FAA/APO-110
HOURS FLOWN	
Hours flown by equipment type	FAA/APO-110
FUEL CONSUMED	
Fuel consumed by equipment type	FAA/APO-110
PILOTS	
Active pilots by certificate type	FAA/Mike Monroney Aeronautical Center

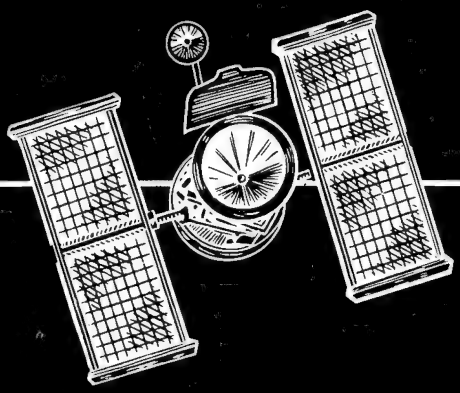
FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
FAA WORKLOAD MEASURES	
FAA TOWERS	
Number of FAA Towers	FAA/APO-130
Number of Contract Towers	FAA/ATR-107
Aircraft Operations:	
Itinerant and local operations by aviation category	FAA/APO-130
Instrument operations by aviation category	FAA/APO-130
Non-IFR Instrument Operations:	
Terminal control areas	FAA/APO-130
Expanded radar service areas	FAA/APO-130
AIR ROUTE TRAFFIC CONTROL CENTERS	
IFR departures by aviation category	FAA/APO-130
IFR overs by aviation category	FAA/APO-130
FLIGHT SERVICE STATIONS	
IFR-DVFR flight plans originated	FAA/APO-130
VFR flight plans originated	FAA/APO-130
Pilot briefings	FAA/APO-130
Aircraft contacted by aviation category	FAA/APO-130
IFR-DVFR aircraft contacted	FAA/APO-130
VFR aircraft contacted	FAA/APO-130

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

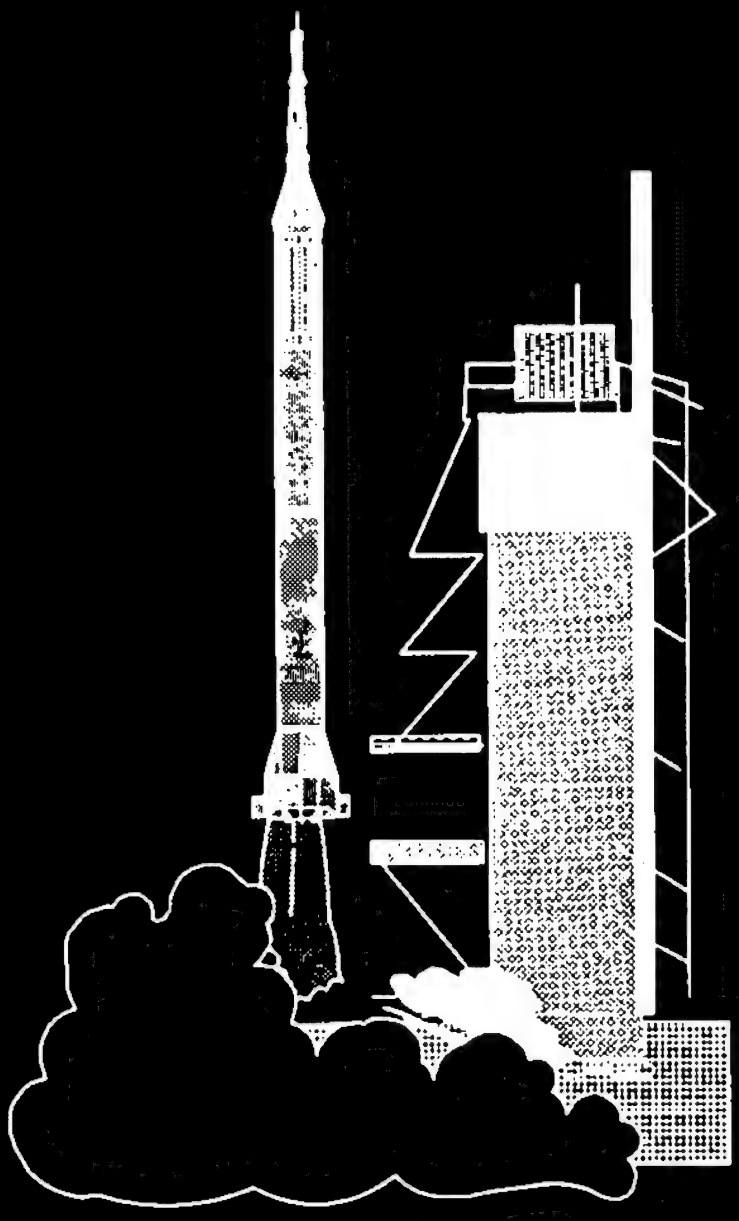
TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
TERMINAL AREA FORECASTS (3,265 Towered and Nontowered Airports)	
ENPLANEMENTS	
U. S. Flag Carrier	BTS
Foreign Flag Carrier	INS/BTS
Regional/Commuter	BTS
Air Taxi	FAA/VNTSC
OPERATIONS	
Towered Airports:	
Aircraft operations by aviation segment	FAA/APO-130
Scheduled commuter	OAG
Nontowered Airports	FAA/NFDC
Scheduled commuter	OAG

AFS-620--Operations Systems Branch, FAA
APO-110--Statistics and Forecast Branch, FAA
APO-130--Information Systems Branch, FAA
ATP-140--Contract Air Traffic Services, FAA
BTS--Bureau of Transportation Statistics, Department of Transportation
CBO--Congressional Budget Office
DRI--DRI/McGraw-Hill, Inc.
INS--Immigration and Naturalization Service, Department of Justice
NFDC--National Flight Data Center, FAA
OAG--North American Official Airline Guide
OMB--Office of Management and Budget
VNTSC--Volpe National Transportation Systems Center, Research and Special Programs Administration, Department of Transportation
WEFA--WEFA, Inc.



CHAPTER IX

COMMERCIAL SPACE TRANSPORTATION



CHAPTER IX

COMMERCIAL SPACE TRANSPORTATION

The Federal Aviation Administration's (FAA) Associate Administrator for Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launch activity as authorized by Executive Order 12465, *Commercial Expendable Launch Vehicle Activities*, and the *Commercial Space Launch Act of 1984*, as amended. AST's mission is to license and regulate commercial launch and reentry operations to protect public health and safety, the safety of property, and the national security and foreign policy interests of the United States. The *Commercial Space Launch Act of 1984* and the *1996 National Space Policy* also direct the FAA to encourage, facilitate, and promote commercial launches.

INTRODUCTION TO COMMERCIAL SPACE TRANSPORTATION

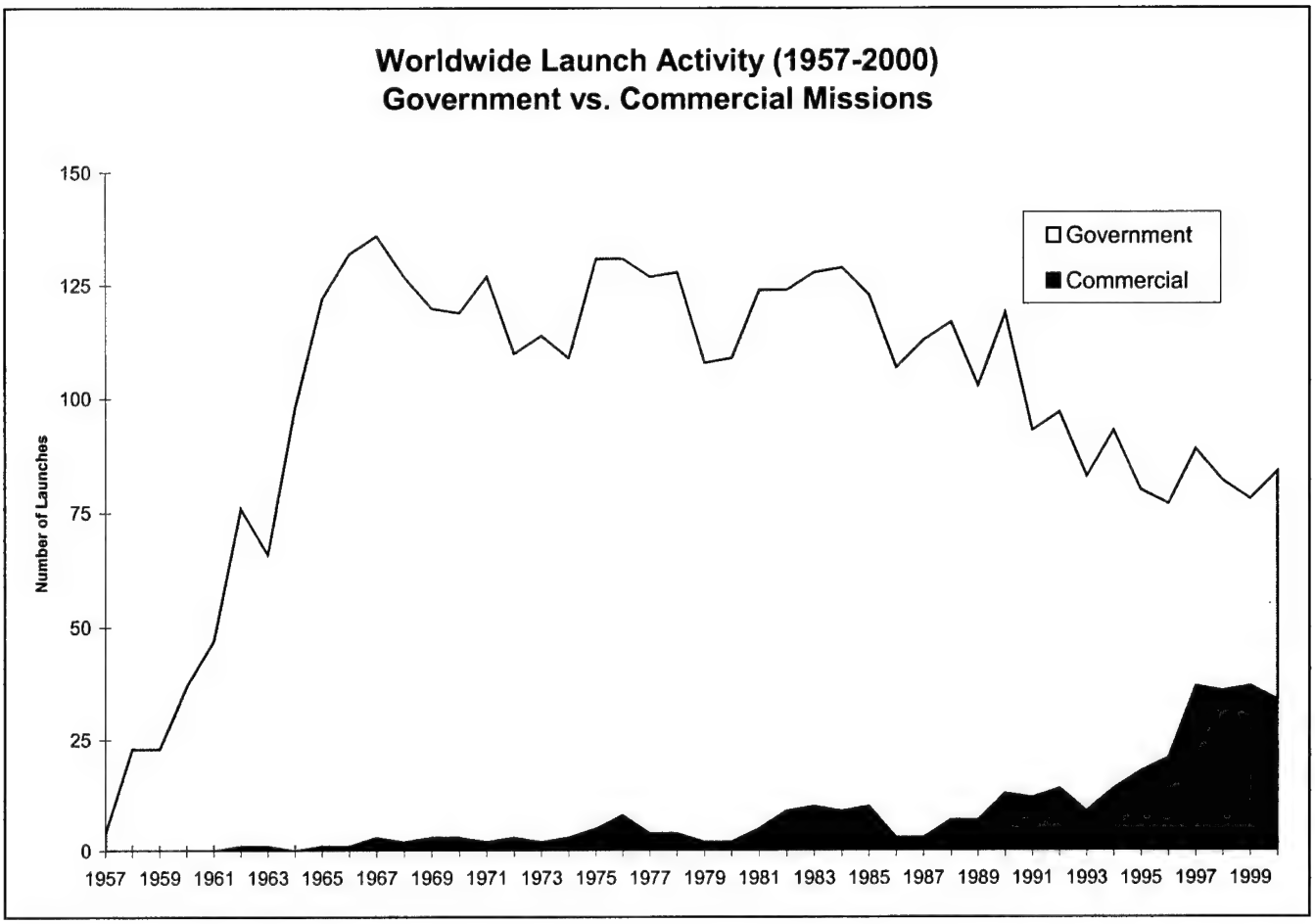
WHAT IS COMMERCIAL SPACE TRANSPORTATION?

The term "commercial space transportation" refers to the launch (or reentry) of an object into (or from) space by a private sector, non-governmental entity. Within the United States, commercial space launches are conducted by corporations such as Boeing, Lockheed Martin, and Orbital Sciences using expendable launch vehicles (ELVs)[1] to place spacecraft into orbit. Worldwide, commercial launch services are currently offered by companies from six countries—the United States, Europe, Russia, China, Japan, and Ukraine.

A "commercial launch" may carry a commercial, civil, or military payload into space, but is considered commercial because the launch service is commercially procured by the payload owner. For example, some U.S. Government payloads are commercially procured by the Government while others are launched by the U.S. Air Force or the National Aeronautics and Space Administration (NASA) using the same rockets. The FAA licenses those launches within the United States that are commercially procured, including those for U.S. and foreign governments.

The FAA also regulates and licenses non-commercial launches conducted by private citizens within the United States, providing an exception for amateur rocket launch activities.

[1] Expendable launch vehicles are used only once, with stages falling back to Earth or remaining in orbit after use.



COMMERCIAL USE OF SPACE

Since the launch of Sputnik in 1957, the use of space and the launching of objects into space has largely been a government endeavor. Governments launched vehicles to deploy satellites for both civil and military purposes, and the business of launching space vehicles has been dominated by governments until only recently. Satellites serving commercial or quasi-commercial purposes, however, were first launched in the early 1960's, even though the business of launching them was strictly a government affair. Many of the early 'commercial' satellites launched were telecommunications spacecraft located in geostationary orbit[2] (GEO) for video broadcasting and international telephony under the auspices of international governmental treaty organizations, such as Intelsat, the International Telecommunications Satellite Organization (formed in 1971).

Launches of satellites that serve commercial purposes have steadily increased since the early 1980's, and now represent about 40 to 45 percent of launches conducted worldwide annually. Until the last couple of years, commercial spacecraft were almost exclusively telecommunications satellites located in geostationary orbit. Now commercial spacecraft serve more diverse applications. In 1997, full-scale deployment began of the first low Earth orbit (LEO)[3] constellations for mobile communications. Commercial satellites also

[2] A spacecraft in geostationary orbit remains over the same spot on Earth, orbiting once every 24 hours, as does the Earth itself. GEO is a circular orbit at an altitude of 22,300 miles with a low inclination (i.e. over the equator).

[3] Satellites in LEO do not remain above a fixed point on Earth; rather they orbit every 90 minutes to 12 hours, depending on their altitude. Non-geostationary orbits (NGSO) include medium Earth orbit (MEO) and elliptical orbits.

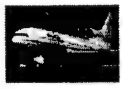
now include spacecraft for remote sensing. Commercial launch service providers have conducted test launches of their new vehicles, and while these launches did not deploy a satellite for a paying customer, they do represent non-government launch activity. Even flights to the Russian Mir space station have received financing from a private entity.

U.S. COMMERCIAL LAUNCH SERVICES

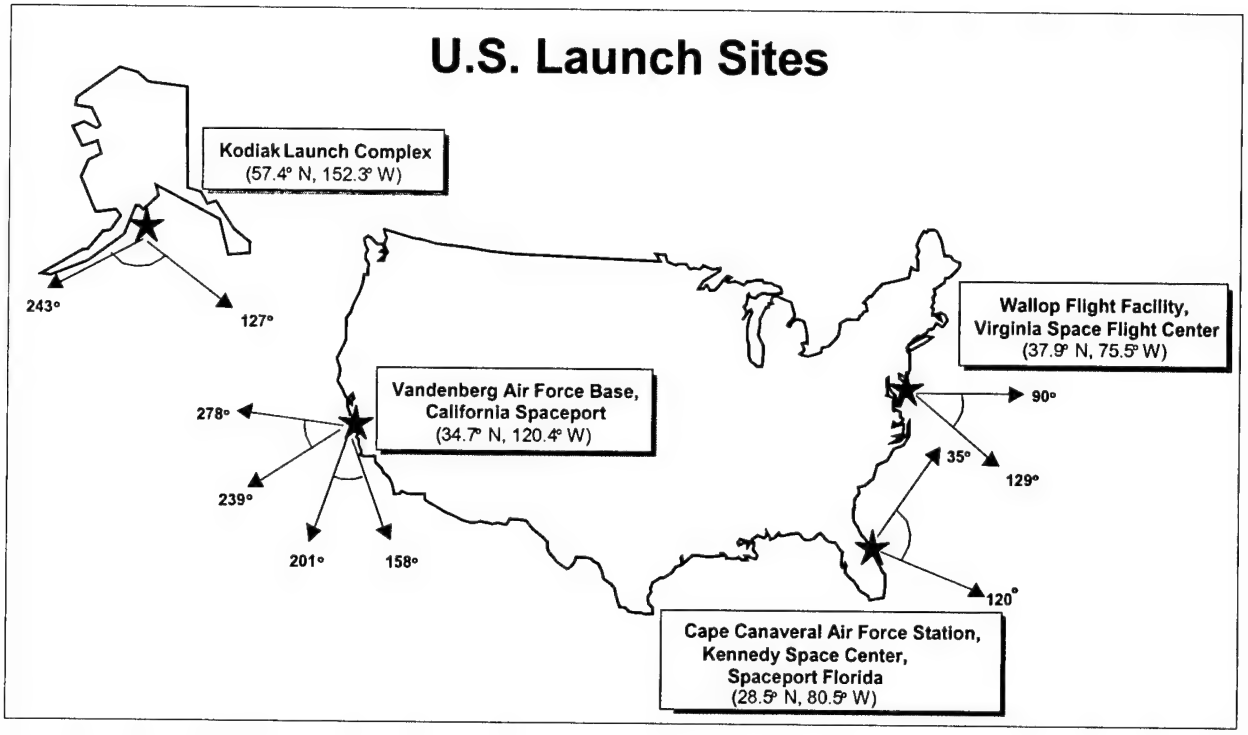
Up until the early 1980's, commercial spacecraft were launched on rockets owned and operated by the U.S. Government, including the Space Shuttle, and no other nation launched satellites for commercial entities. When Europe's Ariane began offering launch services for commercial satellites in 1983, an international launch market was created, and has since grown to over 15 vehicle families worldwide. Following the passage of the *Commercial Space Launch Act of 1984,* the U.S. Government and industry began to transition from government to commercial operations for expendable launch vehicles. The *Commercial Space Launch Act* authorized the Department of Transportation to regulate and license commercial launch activities. Commercial launches licensed by the Department of Transportation (now by the FAA) actually began in 1989 after the U.S. Government decided to stop launching commercial payloads on the Space Shuttle following the *Challenger* explosion in 1986. A commercial launch licensed by the FAA, as distinct from a commercial satellite, can orbit satellites from commercial, non-profit, or government entities, as long as the launch was procured as a service through one of the U.S. commercial launch service providers. The U.S. government, through the Department of Defense and NASA, still launch some spacecraft through vehicle procurement contracts, as opposed to launch service contracts. Such launches are not licensed by the FAA. U.S. expendable launch vehicles vary in size and the companies licensed by the FAA to conduct launches are:

- Lockheed Martin
  - Atlas 2 and 3 (intermediate class)
  - Athena 1 and 2 (small class)
- Boeing
  - Delta 2 (medium class)
  - Delta 3 (intermediate class)
- Sea Launch
  - Zenit 3SL (intermediate class)

U.S. and International Partner Commercial Launch Systems

	Small			Medium	Intermediate				Large		Super Heavy
											
Vehicle Company	Pegasus OSC	Athena Lock-Mart	Taurus OSC	Delta 2 Boeing	Delta 3 Boeing	Atlas 2/3 ILS	Proton* ILS	Zenit 3SL Sea Launch	Delta 4 Boeing	Atlas 5 ILS	Delta 4 Heavy Boeing
1st Com. Launch	1993	1995	1998	1989	1999	1990	1996	1999	2001	2002	Not before 2003

*Not FAA-Licensed



- Orbital Sciences
  Pegasus and Taurus (small class)

U.S. commercial launches to GEO are launched from the Cape Canaveral Air Force Station (CCAFS) in Florida. Launches to LEO take place from the Cape, Vandenberg Air Force Base (VAFB) in California, or the Wallops Flight Facility in Virginia depending on the inclination of their intended orbit (see figure "U.S. Launch Sites" above).

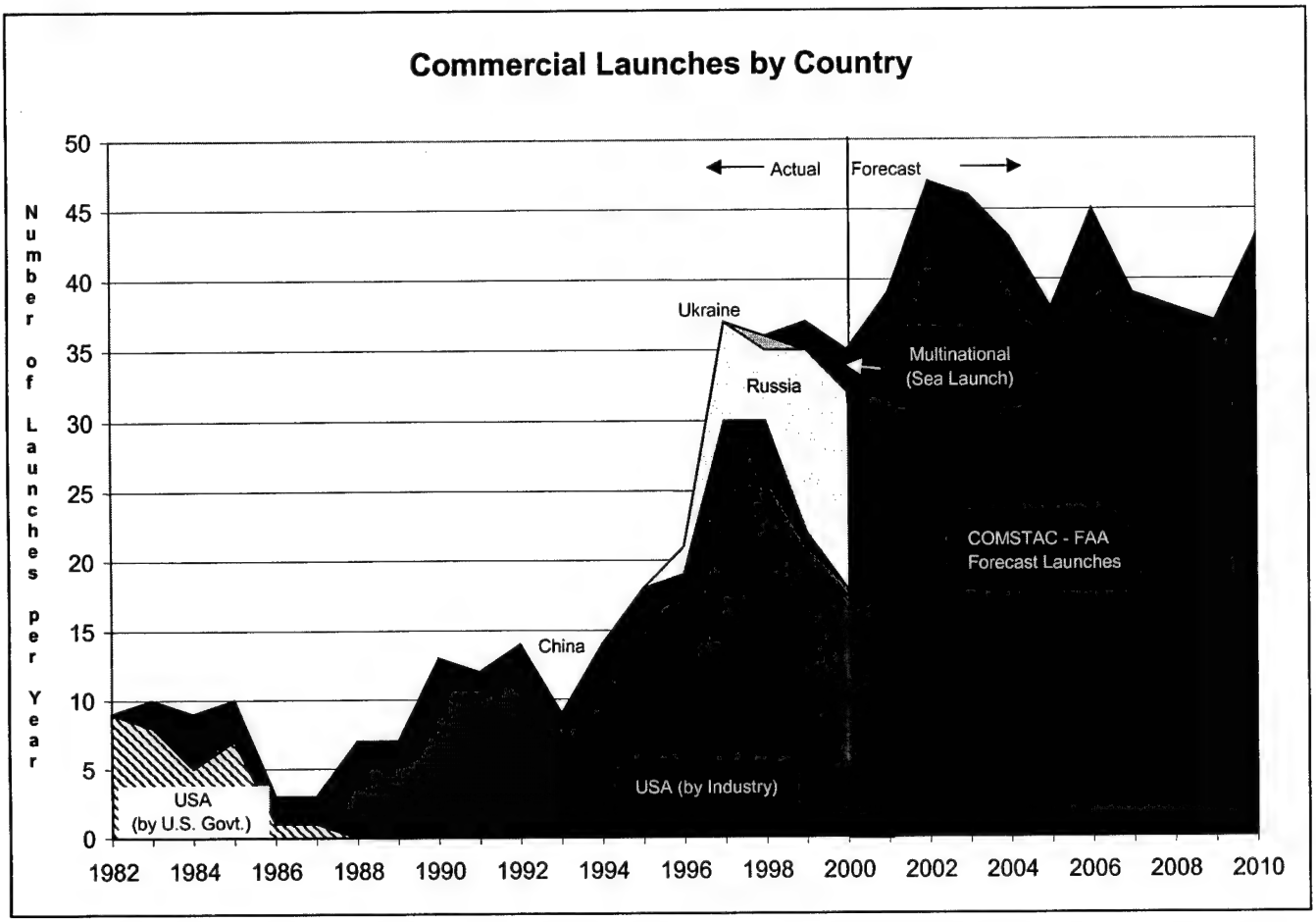
The FAA has issued four launch site operator licenses to state-run organizations to operate commercial launch sites, or spaceports. They are:

- Spaceport Florida, at Cape Canaveral Air Force Station, Florida,
- California Spaceport, at Vandenberg Air Force Base, California,
- Virginia Space Flight Center, at Wallop's Island, Virginia, and
- Kodiak Launch Complex, Kodiak Island, Alaska, the first spaceport not located on a federal range.

REVIEW OF 2000

Commercial launch activity worldwide remained relatively steady in 2000 compared to recent years, despite the fallout over the Iridium and Orbcomm bankruptcies, and skepticism surrounding LEO constellations in general. This drop-off was averted due to launches dedicated to new services such as direct radio broadcasting, commercial remote sensing, and even privately financed flights to Mir.

There were 35 commercial launches out of a total of 85 orbital flights in 2000, including two FAA-licensed launches for U.S. government customers. The figure represents just over 42 percent of total launches. Despite the continued robustness of the overall market, the number of FAA-licensed commercial launches fell in 2000, from 17 in 1999 to 10 in 2000. Seven of these launches were conducted for commercial customers, two for U.S. government payloads, and one was a test flight for Boeing's Delta 3.

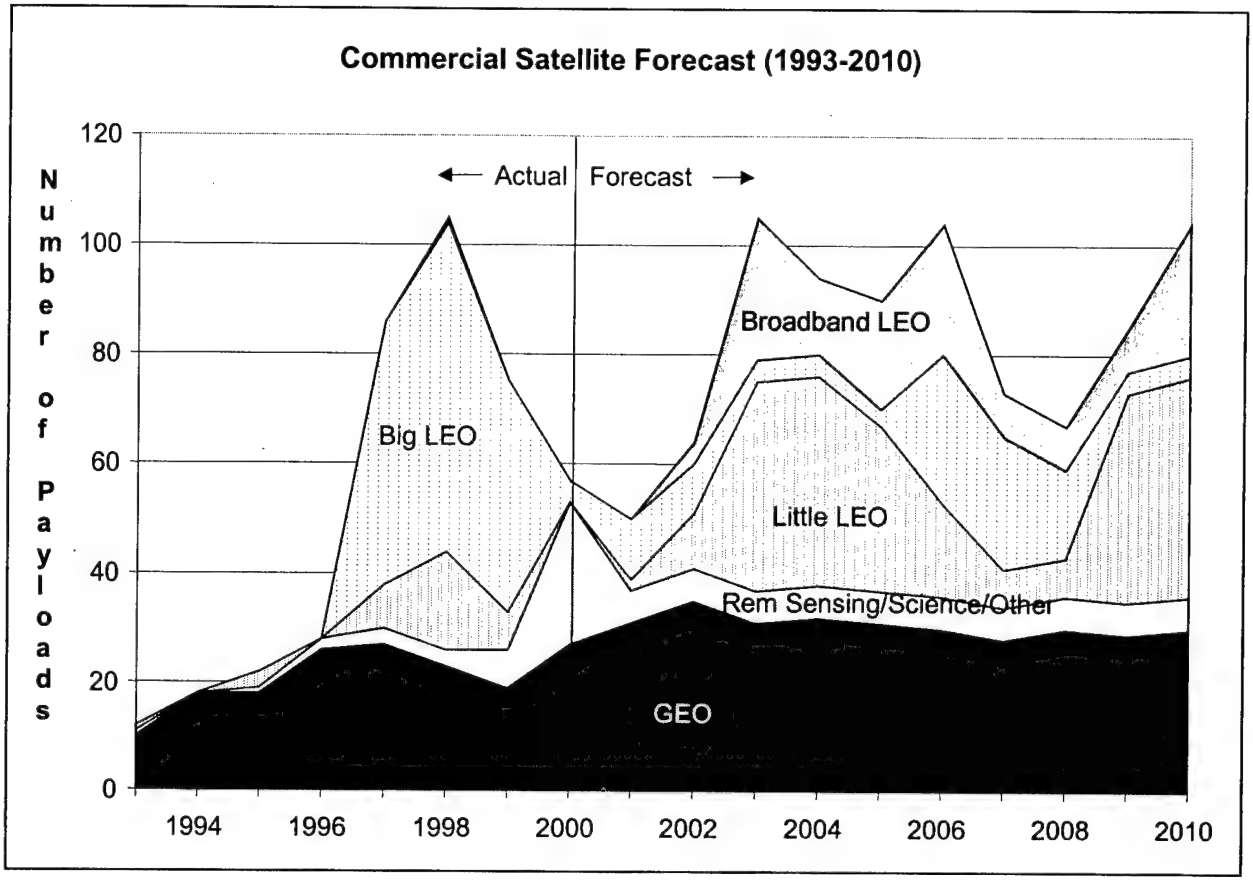


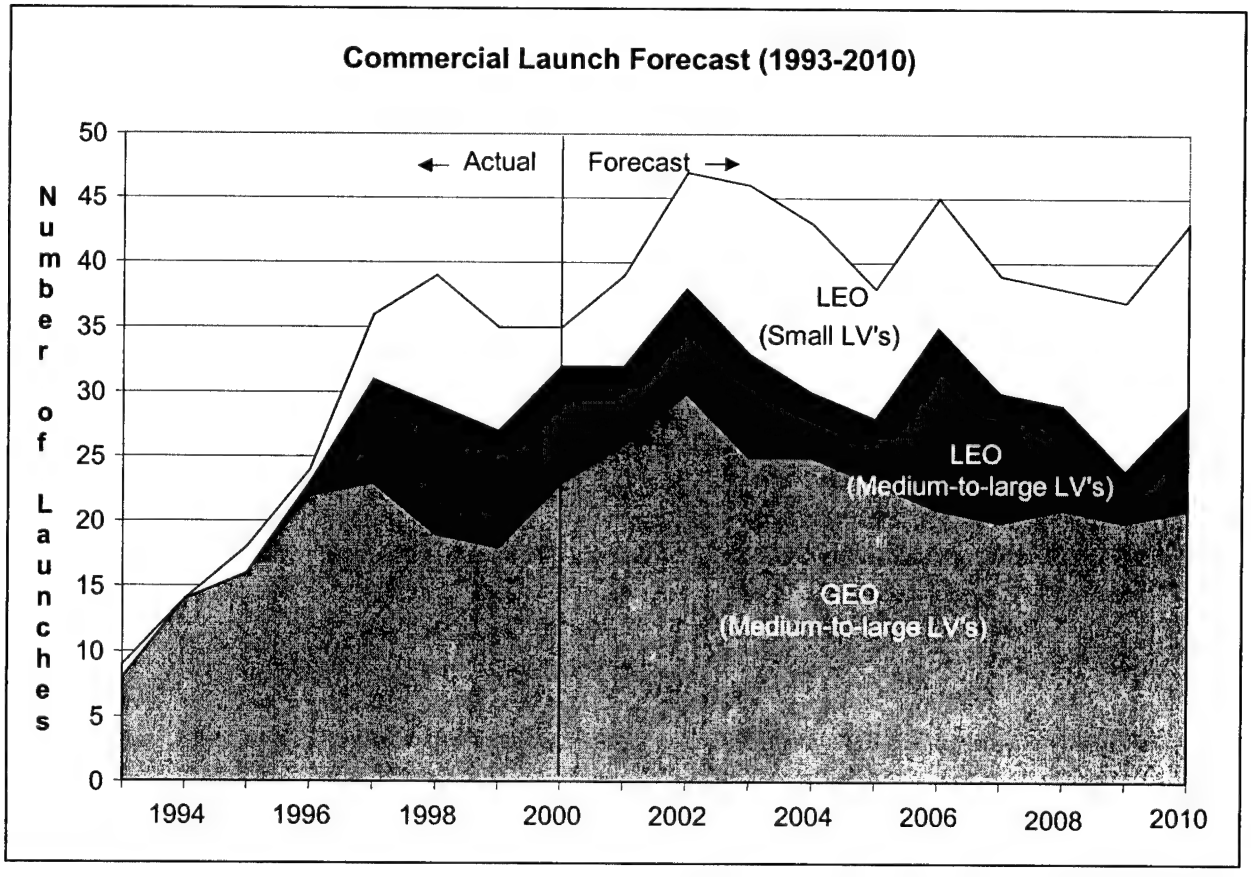
Of the seven for commercial customers, three were conducted by the multinational Sea Launch partnership led by Boeing. Lockheed Martin's International Launch Services (ILS) successfully flew its first Atlas 3A launch vehicle, which featured an entirely new first stage using a Russian-built engine. ILS also deployed two GEO communications satellites on Atlas 2AS vehicles, Boeing successfully tested its Delta 3 vehicle to deploy a dummy payload, and deployed four Globalstar satellites to LEO using a Delta 2. Orbital Sciences Corporation deployed two small U.S. government satellites on two Pegasus vehicles. In addition to the seven licensed commercial launches conducted from U.S. ranges, there were 21 U.S. civil and military launches including the Space Shuttle.

Russian launch ranges deployed 13 vehicles for commercial missions, and Europe's Ariane vehicles flew 12 times. China did not launch any commercial payloads in 2000. Therefore, including the seven launches from U.S. ranges and the three flights for Sea Launch, a total of 35 commercial launches were conducted this year.

COMMERCIAL SPACE TRANSPORTATION FORECASTS

In May 2000, the FAA and the Commercial Space Transportation Advisory Committee (COMSTAC) published their annual forecast for commercial launch demand. The forecast combined the *COMSTAC 2000 Commercial Geostationary Launch Demand Model* for satellites that operate in geosynchronous orbit with the FAA's 2000 Commercial Space


Commercial Satellite Forecast (1993-2010)
Number of Payloads
120
100
80
60
40
20
0
Actual
Forecast
Broadband LEO
Big LEO
Little LEO
Rem Sensing/Science/Other
GEO
1994
1996
1998
2000
2002
2004
2006
2008
2010


Commercial Launch Forecast (1993-2010)
Number of Launches
50
45
40
35
30
25
20
15
10
5
0
Actual
Forecast
LEO
(Small LV's)
LEO
(Medium-to-large LV's)
GEO
(Medium-to-large LV's)
1994
1996
1998
2000
2002
2004
2006
2008
2010

Transportation Projections for Non-Geosynchronous Orbits (NGSO) *2000 Commercial Space Transportation Forecasts.*

The forecasts project an average of just over 41 commercial space launches annually worldwide through 2010. The business failures of NGSO systems accounted for the reduction from 51 annual launches projected in the 1999 forecast.

The forecasts projects an annual average of:

- 23.5 launches of medium-to-heavy vehicles to deploy GEO communications satellites
- 7.5 launches of medium-to-heavy vehicles to LEO or other NGSO orbits
- 10.4 launches to LEO by small vehicles

These estimates account for dual-manifesting payloads, an important factor especially for NGSO launches.

The forecast is based on inputs from across the satellite and launch service industry and represents the demand for launch services for actual or projected satellite programs in a given year. This would be the peak load on the launch service providers if all projected satellite launches were conducted and is not a prediction of what will actually be launched in a given year.

Several factors can affect the execution of a scheduled launch including launch failures, launch vehicle components problems, or manifesting issues. Regulatory issues such as satellite export compliance or FCC licensing can come into play. Also, changes in business environment can cause satellite companies to reassess their priorities and alter their plans for deploying space assets

GENERAL TRENDS

The commercial space transportation market is driven largely by the demand for launches of telecommunications satellites, and therefore, developments in the industry over the next 5 years will parallel developments in satellite systems, including:

- Continued strong demand for launch of GEO communications satellite systems and an increasing demand for remote sensing systems.
- Lower than anticipated demand for LEO deployments due to business difficulties faced by first constellations.
- An introduction of new larger launch vehicles to meet the demand for launches of heavier GEO spacecraft, including introduction of new U.S. vehicles, Delta 4 and Atlas 5.
- Continued international competition for launch services by Europe, Russia, and China. Possible new entrants in the launch market from India, Israel, and Brazil.
- Continued development of technologies and demonstrators for Reusable Launch Vehicles (RLVs).

CHAPTER X

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

CHAPTER X

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

FISCAL YEARS 2001 – 2012

This chapter provides detailed historical data (1995-2000) and forecasts (20001-2012) for aviation demand and activity at FAA air traffic facilities. The following should be noted:

- **Table 11**: Contains the unduplicated passenger traffic reported by U.S. scheduled air carriers on DOT Form 41 and regional/commuter carriers on DOT Form 298-C.

- **Table 12**: Includes the following traffic, which is also reported as regional/commuter traffic in Table 24.

FISCAL YEAR	ENPLANEMENTS (Millions)	RPMS (Millions)
1995	21.0	4,426
1996	26.3	5,808
1997	26.2	5,930
1998	30.5	7,224
1999	37.5	9,544
2000E	44.7	13,227

- **Table 24**: Includes traffic for regionals/commuters reporting on both DOT Forms 41 and 298-C.

- **Table 26**: Includes all regional passenger aircraft (turboprops and jets) up to 70 seats.

- **Table 31**: Includes the rotorcraft fleet and hours flown in Tables 27 and 28.

TABLE 1

U.S. SHORT-TERM ECONOMIC FORECASTS

ECONOMIC VARIABLE	FISCAL YEAR 2001				FISCAL YEAR 2002			
	1ST. QTR.	2ND. QTR.	3RD QTR.	4TH. QTR.	1ST. QTR.	2ND. QTR.	3RD QTR.	4TH. QTR.
REAL GDP								
(1996 Chained $, Billions)								
DRI/McGRAW-HILL	9,455.6	9,521.8	9,583.5	9,654.7	9,740.9	9,853.6	9,960.9	10,075.1
WEFA, INC.	9,436.6	9,494.4	9,586.5	9,649.9	9,724.3	9,820.9	9,911.7	10,003.8
OMB	9,456.6	9,531.2	9,606.7	9,682.7	9,759.3	9,836.4	9,914.1	9,992.3
OIL AND GAS PRICE INDEX								
(1996 EQUALS 100)								
DRI/McGRAW-HILL	123.0	121.8	121.4	116.9	117.0	114.8	114.8	114.8
WEFA, INC.	127.7	130.1	120.9	118.3	119.0	112.7	114.6	115.0
OMB	130.0	121.5	114.8	109.1	103.7	99.1	95.2	92.2
CONSUMER PRICE INDEX								
(1982-84 EQUALS 100)								
DRI/McGRAW-HILL	174.4	175.3	176.2	176.9	177.7	178.4	179.2	180.0
WEFA, INC.	174.4	175.5	176.5	177.5	178.6	179.5	180.7	182.1
OMB	174.1	175.2	176.3	177.4	178.5	179.6	180.8	182.0

Source: DRI/McGraw-Hill, Inc., December 2000; WEFA, Inc., December 2000; and Office of Management and Budget, November 2000.

TABLE 2

U.S. LONG-TERM ECONOMIC FORECASTS

FISCAL YEAR	GROSS DOMESTIC PRODUCT (Billions 1996$)	CONSUMER PRICE INDEX (1982-84=100)	OIL AND GAS PRICE INDEX (1996 = 100)
Historical			
1995	7,503.6	151.5	95.2
1996	7,735.8	155.8	97.6
1997	8,074.1	159.9	100.7
1998	8,420.3	162.5	91.6
1999	8,768.4	165.6	90.7
2000E	9,244.2	170.9	117.4
Forecast			
2001	9,569.3	175.8	118.9
2002	9,875.5	180.2	97.6
2003	10,191.6	185.0	90.5
2004	10,518.0	190.0	92.3
2005	10,854.8	195.1	94.2
2006	11,198.2	200.4	96.2
2007	11,541.2	205.8	98.2
2008	11,883.0	211.3	100.2
2009	12,227.4	217.0	102.3
2010	12,581.8	222.9	104.4
2011	12,946.2	228.9	106.6
2012	13,321.2	235.1	108.8

Source: 2000-2011; Office of Management and Budget, November 2000. Extrapolated to 2012.

TABLE 3

ALTERNATIVE U.S. LONG-TERM ECONOMIC FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (Billions 1996$)			CONSUMER PRICE INDEX (1982-84 = 100)			OIL AND GAS PRICE INDEX (1996 = 100)		
	DRI	WEFA	CONSENSUS	DRI	WEFA	CONSENSUS	DRI	WEFA	CONSENSUS
Historical									
1995	7,543.8	7,543.8	7,543.8	152.5	152.5	152.5	94.2	94.2	94.2
1996	7,813.1	7,813.1	7,813.1	157.0	157.0	157.0	100.0	100.0	100.0
1997	8,159.5	8,159.5	8,159.5	160.6	160.6	160.6	100.0	100.0	100.0
1998	8,515.7	8,515.7	8,515.7	163.2	163.2	163.2	87.9	87.9	87.9
1999	8,875.8	8,875.8	8,875.8	166.7	166.7	166.7	95.7	95.7	95.7
2000E	9,335.0	9,330.2	9,332.6	172.3	172.3	172.3	122.1	123.3	122.7
Forecast									
2001	9,625.2	9,613.8	9,619.5	176.5	177.0	176.8	119.3	122.1	120.7
2002	10,020.9	9,955.4	9,988.2	179.6	181.4	180.5	114.8	114.2	114.5
2003	10,487.3	10,315.4	10,401.4	183.1	186.5	184.8	115.0	115.9	115.4
2004	10,881.7	10,680.0	10,780.9	187.2	191.7	189.4	115.3	116.8	116.1
2005	11,247.8	11,017.1	11,132.4	191.7	197.0	194.3	116.1	117.3	116.7
2006	11,610.0	11,360.3	11,485.1	196.7	202.1	199.4	118.1	118.7	118.4
2007	11,982.9	11,717.2	11,850.0	202.0	207.3	204.7	120.4	121.6	121.0
2008	12,374.0	12,123.7	12,248.8	207.6	212.6	210.1	122.8	124.5	123.7
2009	12,777.5	12,545.6	12,661.6	213.6	218.1	215.8	125.8	128.3	127.1
2010	13,215.0	12,949.1	13,082.0	220.0	223.5	221.8	129.1	132.3	130.7
2011	13,681.5	13,351.8	13,516.7	226.5	229.1	227.8	132.0	135.9	134.0
2012	14,137.4	13,766.0	13,951.7	233.4	234.9	234.1	135.3	139.7	137.5

Source: DRI/McGraw-Hill, December, 2000, and WEFA, Inc., December, 2000.

TABLE 4

INTERNATIONAL GDP FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (In Billions of 1990 U.S. Dollars)				
	CANADA	EUROPE/ AFRICA/ MIDDLE EAST	LATIN AMERICA/ MEXICO	JAPAN/PACIFIC BASIN/CHINA/OTHER ASIA/AUSTRALIA/ N. ZEALAND	WORLD
Historical					
1995	633.7	8,965.8	1,215.6	5,845.2	23,558.5
1996	643.4	9,151.8	1,260.1	6,196.2	24,370.7
1997	671.5	9,387.0	1,327.7	6,407.0	25,214.7
1998	693.7	9,628.5	1,353.1	6,370.0	25,763.3
1999	725.2	9,842.2	1,357.6	6,563.4	26,528.1
2000E	759.4	10,196.3	1,417.3	6,847.5	27,687.6
Forecast					
2001	783.8	10,535.4	1,480.8	7,159.1	28,736.9
2002	807.4	10,842.3	1,548.4	7,493.2	29,773.7
2003	829.8	11,155.2	1,619.2	7,821.2	30,840.9
2004	852.7	11,471.7	1,696.0	8,156.4	31,912.1
2005	876.3	11,791.8	1,777.3	8,512.0	33,003.2
2006	900.3	12,118.2	1,852.3	8,895.1	34,131.6
2007	923.1	12,447.2	1,928.4	9,306.2	35,278.5
2008	942.3	12,783.9	2,014.6	9,748.5	36,467.9
2009	965.0	13,129.1	2,102.1	10,220.1	37,694.9
2010	990.1	13,480.2	2,190.0	10,713.7	38,954.1
2011	1,017.4	13,842.1	2,279.1	11,207.7	40,233.7
2012	1,046.5	14,212.4	2,369.3	11,717.8	41,550.1

Source: WEFA, Inc., World Economic Outlook, November 2000.

TABLE 5

INTERNATIONAL EXCHANGE RATE FORECASTS

CALENDAR YEAR	FOREIGN EXCHANGE RATES (US$/Local Currency, Average)					UNITED STATES OECD TRADE-WEIGHTED NOMINAL EXCHANGE RATE (1990 EQUALS 100)
	CANADA	EURO	UNITED KINGDOM	WEST/UNITED GERMANY	JAPAN*	
Historical						
1995	0.729	--	1.578	0.698	10.632	96.7
1996	0.733	--	1.560	0.665	9.193	101.2
1997	0.722	--	1.640	0.577	8.265	109.1
1998	0.674	--	1.658	0.568	7.639	115.3
1999	0.673	1.065	1.617	0.545	8.782	113.4
2000E	0.680	0.914	1.540	0.464	9.402	115.0
Forecast						
2001	0.683	0.895	1.595	0.457	9.443	110.9
2002	0.693	1.007	1.606	0.515	9.496	108.1
2003	0.707	1.090	1.611	0.557	9.533	106.8
2004	0.721	1.130	1.614	0.578	9.577	105.5
2005	0.735	1.150	1.616	0.588	9.753	104.2
2006	0.746	1.153	1.618	0.589	9.871	103.4
2007	0.752	1.156	1.621	0.591	9.990	102.9
2008	0.753	1.159	1.625	0.592	10.112	102.6
2009	0.751	1.161	1.627	0.594	10.235	102.4
2010	0.748	1.164	1.631	0.595	10.359	102.2
2011	0.746	1.167	1.643	0.597	10.485	102.0
2012	0.744	1.170	1.651	0.598	10.612	101.7

Source: WEFA, Inc., World Economic Outlook, November 2000.
* U.S. $ per 1,000 Yen.

TABLE 6

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

TOTAL SYSTEM OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 2000 $ (Cents)	CURRENT $ (Cents)	FY 2000 $ (Cents)
Historical*						
1995	160.4	985.4	12.73	14.36	55.56	62.65
1996	158.9	991.9	13.08	14.35	62.51	68.57
1997	159.2	1,007.4	13.00	13.90	67.15	71.76
1998	158.3	1,011.0	13.20	13.88	54.67	57.47
1999	156.9	1,021.3	12.93	13.34	49.69	51.26
2000E	155.1	1,038.5	13.38	13.38	73.57	73.57
Forecast						
2001	155.3	1,049.8	13.69	13.31	74.46	72.38
2002	156.2	1,062.0	13.95	13.22	61.12	57.94
2003	157.4	1,073.6	14.14	13.06	56.67	52.34
2004	158.3	1,085.1	14.31	12.87	57.84	52.02
2005	158.9	1,093.9	14.46	12.66	59.04	51.71
2006	159.8	1,102.6	14.60	12.45	60.26	51.38
2007	161.1	1,111.2	14.75	12.25	61.50	51.06
2008	162.4	1,120.5	14.90	12.05	62.78	50.75
2009	163.8	1,129.2	15.06	11.85	64.08	50.44
2010	165.1	1,138.3	15.21	11.66	65.41	50.14
2011	166.4	1,146.5	15.38	11.48	66.76	49.83
2012	167.6	1,154.6	15.54	11.29	68.14	49.52

* Source: Form 41, U.S. Department of Transportation.

TABLE 7

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

DOMESTIC OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 2000 $ (Cents)	CURRENT $ (Cents)	FY 2000 $ (Cents)
Historical*						
1995	143.4	791.0	13.31	15.01	54.1	61.0
1996	141.8	798.6	13.86	15.20	61.2	67.1
1997	142.5	812.0	13.72	14.66	65.7	70.2
1998	142.1	813.5	14.17	14.90	53.5	56.2
1999	141.3	821.1	13.97	14.41	48.5	50.1
2000E	139.3	832.3	14.42	14.42	71.5	71.5
Forecast						
2001	139.0	836.8	14.84	14.42	72.4	70.3
2002	139.4	841.3	15.19	14.40	59.4	56.3
2003	140.2	845.8	15.45	14.27	55.1	50.9
2004	140.7	850.8	15.64	14.06	56.2	50.6
2005	140.9	854.8	15.78	13.82	57.4	50.3
2006	141.4	859.3	15.91	13.56	58.6	49.9
2007	142.5	864.3	16.03	13.31	59.8	49.6
2008	143.5	869.3	16.16	13.06	61.0	49.3
2009	144.4	873.8	16.29	12.82	62.3	49.0
2010	145.4	878.3	16.42	12.59	63.6	48.7
2011	146.4	882.8	16.55	12.35	64.9	48.4
2012	147.4	887.3	16.68	12.12	66.2	48.1

* Source: Form 41, U.S. Department of Transportation.

TABLE 8

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 1)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 2000 $ (Cents)	CURRENT $ (Cents)	FY 2000 $ (Cents)
Historical*						
1995	247.6	2,973.0	11.17	12.59	59.8	67.5
1996	248.6	3,017.7	10.92	11.98	66.3	72.7
1997	245.1	3,035.6	11.01	11.77	71.2	76.1
1998	236.2	3,073.9	10.53	11.07	57.9	60.8
1999	232.4	3,185.6	10.04	10.36	52.9	54.5
2000E	234.1	3,321.9	10.50	10.50	78.7	78.7
Forecast						
2001	234.5	3,338.9	10.59	10.30	79.6	77.4
2002	235.4	3,350.3	10.70	10.15	65.4	62.0
2003	236.6	3,359.1	10.84	10.01	60.6	56.0
2004	237.8	3,368.2	11.05	9.94	61.9	55.6
2005	239.1	3,373.8	11.26	9.86	63.1	55.3
2006	240.5	3,379.4	11.50	9.80	64.4	54.9
2007	241.8	3,381.5	11.74	9.75	65.8	54.6
2008	243.1	3,381.9	11.99	9.69	67.1	54.3
2009	244.4	3,382.0	12.25	9.64	68.5	53.9
2010	245.7	3,384.9	12.51	9.59	69.9	53.6
2011	246.9	3,384.7	12.77	9.53	71.4	53.3
2012	248.2	3,386.0	13.04	9.48	72.9	53.0

* Source: Form 41, U.S. Department of Transportation.

TABLE 9

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 2)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT			REVENUE PER PASSENGER MILE					
				ATLANTIC		LATIN AMERICA		PACIFIC	
	ATLANTIC (Seats)	LATIN AMERICA (Seats)	PACIFIC (Seats)	CURRENT $ (Cents)	FY 2000 $ (Cents)	CURRENT $ (Cents)	FY 2000 $ (Cents)	CURRENT $ (Cents)	FY 2000$ (Cents)
Historical*									
1995	238.2	180.1	322.0	9.88	11.14	13.70	15.45	11.55	13.02
1996	237.5	182.2	326.6	10.25	11.24	13.53	14.84	10.50	11.52
1997	231.9	180.4	329.1	10.31	11.02	14.06	15.03	10.33	11.04
1998	228.4	177.6	318.2	10.13	10.65	13.72	14.42	9.25	9.72
1999	229.6	176.6	303.8	9.61	9.91	12.76	13.16	9.00	9.28
2000E	233.7	173.5	308.0	9.72	9.72	13.21	13.21	9.99	9.99
Forecast									
2001	234.7	174.0	308.0	9.75	9.48	13.25	12.88	10.21	9.92
2002	235.7	175.0	311.0	9.80	9.29	13.31	12.62	10.41	9.87
2003	237.2	176.0	313.0	9.85	9.10	13.46	12.43	10.63	9.82
2004	238.7	177.0	315.0	10.02	9.01	13.76	12.37	10.84	9.75
2005	240.2	178.0	317.0	10.19	8.92	14.05	12.31	11.02	9.65
2006	241.7	179.0	319.0	10.41	8.88	14.36	12.25	11.20	9.55
2007	243.2	180.0	321.0	10.64	8.83	14.68	12.19	11.39	9.46
2008	244.7	181.0	323.0	10.87	8.79	15.00	12.13	11.58	9.36
2009	246.2	182.0	325.0	11.11	8.74	15.33	12.06	11.78	9.27
2010	247.7	183.0	327.0	11.35	8.70	15.66	12.00	11.97	9.18
2011	249.2	184.0	329.0	11.60	8.66	16.00	11.94	12.17	9.09
2012	250.7	185.0	331.0	11.85	8.61	16.35	11.88	12.38	8.99

* Source: Form 41, U.S. Department of Transportation.

TABLE 10

U.S. AND FOREIGN FLAG CARRIERS

TOTAL PASSENGER TRAFFIC TO/FROM THE UNITED STATES

CALENDAR YEAR	TOTAL PASSENGERS BY WORLD TRAVEL AREA (Millions)				
	ATLANTIC	LATIN AMERICA	PACIFIC	U.S./CANADA TRANSBORDER	TOTAL
Historical*					
1995	37.0	32.1	20.8	14.8	104.7
1996	39.6	33.6	22.9	17.1	113.2
1997	43.7	35.3	24.5	18.1	121.6
1998	46.6	37.6	22.9	19.1	126.2
1999	48.7	38.8	24.2	19.7	131.3
2000E	52.7	39.4	26.5	20.6	139.2
Forecast					
2001	55.4	42.0	28.4	21.5	147.3
2002	58.5	45.0	30.3	22.3	156.2
2003	62.0	48.4	32.2	23.1	165.8
2004	65.4	51.9	34.2	24.1	175.6
2005	68.5	55.5	36.2	25.1	185.3
2006	71.6	59.1	38.4	26.1	195.2
2007	71.8	62.8	40.8	27.2	202.6
2008	74.8	67.1	43.4	28.3	213.5
2009	77.7	71.6	46.1	29.4	224.8
2010	85.6	76.3	48.9	30.5	241.4
2011	89.4	81.2	51.8	31.7	254.1
2012	93.2	86.2	54.7	32.9	267.0

* Sources: Atlantic, Pacific, and Latin America, INS Form I-92, U.S. Department of Commerce; U.S./ Canada Transborder, Transport Canada.

TABLE 11

U.S. COMMERCIAL AIR CARRIERS AND REGIONALS/COMMUTERS

TOTAL SCHEDULED U.S. PASSENGER TRAFFIC 1/

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1995	531.1	48.6	579.7	400.0	144.3	544.3
1996	558.1	50.0	608.1	426.4	150.9	577.3
1997	579.1	52.3	631.4	449.2	158.8	608.0
1998	590.4	53.1	643.5	460.1	163.3	623.4
1999	612.9	53.3	666.2	482.4	169.7	652.1
2000E	639.1	54.6	693.7	512.0	181.3	693.3
Forecast						
2001	657.2	58.1	715.3	530.7	194.0	724.7
2002	678.1	62.1	740.1	550.2	207.9	758.1
2003	702.2	66.4	768.6	572.5	222.9	795.4
2004	728.8	70.8	799.6	597.4	238.5	835.9
2005	757.8	75.2	833.1	623.9	253.8	877.7
2006	788.4	79.6	868.0	652.2	269.1	921.3
2007	818.8	84.1	902.9	681.1	284.5	965.6
2008	849.5	89.1	938.6	710.6	301.3	1,011.9
2009	881.1	94.3	975.4	740.6	318.9	1,059.5
2010	913.8	99.8	1,013.5	771.9	337.7	1,109.6
2011	947.7	105.4	1,053.1	804.5	356.6	1,161.1
2012	982.9	111.0	1,093.9	838.4	376.0	1,214.4

* Source: Forms 41 and 298-C, U.S. Department of Transportation.
1/ Sum of Table's 12 and 24 less duplicated traffic.

TABLE 12

U. S. COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1995	496.3	48.6	544.9	392.6	144.3	536.9
1996	524.5	50.0	574.5	418.9	150.9	569.8
1997	543.0	52.3	595.3	440.9	158.8	599.7
1998	555.0	53.1	608.1	451.5	163.3	614.8
1999	576.1	53.3	629.4	473.1	169.7	642.8
2000E	604.1	54.6	658.7	502.8	181.3	684.0
Forecast						
2001	624.3	58.1	682.4	522.4	194.0	716.4
2002	643.3	62.1	705.4	541.2	207.9	749.1
2003	665.5	66.4	731.9	562.8	222.9	785.7
2004	690.0	70.8	760.8	587.0	238.5	825.5
2005	717.0	75.2	792.2	612.9	253.8	866.7
2006	745.3	79.6	824.9	640.4	269.1	909.5
2007	773.6	84.1	857.7	668.6	284.5	953.1
2008	802.2	89.1	891.3	697.4	301.3	998.7
2009	831.6	94.3	925.9	726.6	318.9	1,045.5
2010	862.1	99.8	961.9	757.2	337.7	1,094.9
2011	893.8	105.4	999.2	789.0	356.6	1,145.6
2012	926.6	111.0	1,037.6	822.1	376.0	1,198.1

* Source: Form 41, U.S. Department of Transportation.

TABLE 13

U.S. COMMERCIAL AIR CARRIERS

SCHEDULED INTERNATIONAL PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (MIL)				REVENUE PASSENGER MILES (BIL)			
	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL
Historical*								
1995	16.2	18.0	14.3	48.6	64.4	24.4	55.5	144.3
1996	15.8	18.9	15.3	50.0	64.9	26.3	59.7	150.9
1997	16.5	20.0	15.8	52.3	68.2	29.5	61.1	158.8
1998	18.0	21.0	14.1	53.1	74.6	32.0	56.7	163.3
1999	19.1	21.9	12.3	53.3	79.6	34.1	56.1	169.7
2000E	20.9	22.5	11.2	54.6	87.1	35.8	58.4	181.3
Forecast								
2001	22.2	24.1	11.8	58.1	92.9	38.7	62.4	194.0
2002	23.6	25.9	12.5	62.1	99.2	42.0	66.7	207.9
2003	25.1	27.9	13.3	66.4	106.1	45.5	71.3	222.9
2004	26.6	29.9	14.3	70.8	112.9	49.2	76.4	238.5
2005	28.0	32.0	15.2	75.2	119.2	52.9	81.7	253.8
2006	29.5	34.0	16.1	79.6	125.6	56.6	86.9	269.1
2007	30.8	36.2	17.1	84.1	131.6	60.5	92.4	284.5
2008	32.2	38.7	18.2	89.1	138.0	64.9	98.4	301.3
2009	33.7	41.3	19.3	94.3	144.6	69.6	104.7	318.9
2010	35.2	44.0	20.5	99.8	151.7	74.6	111.4	337.7
2011	36.8	46.8	21.7	105.4	158.8	79.7	118.1	356.6
2012	38.4	49.7	23.0	111.0	165.9	85.0	125.1	376.0

Source: Form 41, U.S. Department of Transportation.
Note: Detail may not add to total because of rounding.

TABLE 14

U.S. COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

FISCAL YEAR	DOMESTIC			INTERNATIONAL		
	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR
Historical*						
1995	602.1	392.6	65.2	202.3	144.3	71.4
1996	621.1	418.9	67.4	206.9	150.9	73.0
1997	639.9	440.9	68.9	213.8	158.8	74.3
1998	644.3	451.5	70.1	223.3	163.3	73.1
1999	677.9	473.1	69.8	229.6	169.7	73.9
2000E	709.1	502.8	70.9	238.6	181.3	76.0
Forecast						
2001	741.0	522.4	70.5	257.5	194.0	75.3
2002	770.4	541.2	70.2	275.2	207.9	75.5
2003	804.0	562.8	70.0	293.9	222.9	75.8
2004	835.6	587.0	70.3	313.2	238.5	76.1
2005	870.5	612.9	70.4	331.9	253.8	76.5
2006	908.4	640.4	70.5	351.7	269.1	76.5
2007	948.4	668.6	70.5	372.0	284.5	76.5
2008	989.2	697.4	70.5	394.2	301.3	76.4
2009	1030.7	726.6	70.5	417.5	318.9	76.4
2010	1074.0	757.2	70.5	442.2	337.7	76.4
2011	1119.1	789.0	70.5	467.3	356.6	76.3
2012	1166.1	822.1	70.5	492.9	376.0	76.3

Source: Form 41, U.S. Department of Transportation.

TABLE 15

U.S. COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS BY INTERNATIONAL TRAVEL REGIONS

FISCAL YEAR	ATLANTIC			LATIN AMERICA			PACIFIC		
	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR
Historical*									
1995	85.9	64.4	75.0	38.8	24.4	63.0	77.6	55.5	71.5
1996	85.1	64.9	76.3	41.6	26.3	63.3	80.2	59.7	74.5
1997	86.7	68.2	78.7	44.8	29.5	65.7	82.3	61.1	74.3
1998	94.6	74.6	78.9	50.9	32.0	62.9	77.9	56.7	72.8
1999	102.6	79.6	77.5	51.8	34.1	65.9	75.2	56.1	74.5
2000E	109.9	87.1	79.2	52.0	35.8	68.8	76.6	58.4	76.2
Forecast									
2001	118.0	92.9	78.7	56.9	38.7	68.0	82.6	62.4	75.5
2002	125.2	99.2	79.2	62.2	42.0	67.5	87.8	66.7	76.0
2003	133.5	106.1	79.5	67.2	45.5	67.7	93.2	71.3	76.5
2004	141.6	112.9	79.7	72.4	49.2	68.0	99.2	76.4	77.0
2005	149.0	119.2	80.0	77.5	52.9	68.3	105.4	81.7	77.5
2006	157.0	125.6	80.0	82.6	56.6	68.5	112.1	86.9	77.5
2007	164.5	131.6	80.0	88.3	60.5	68.5	119.2	92.4	77.5
2008	172.5	138.0	80.0	94.7	64.9	68.5	127.0	98.4	77.5
2009	180.8	144.6	80.0	101.6	69.6	68.5	135.1	104.7	77.5
2010	189.6	151.7	80.0	108.9	74.6	68.5	143.7	111.4	77.5
2011	198.5	158.8	80.0	116.4	79.7	68.5	152.4	118.1	77.5
2012	207.4	165.9	80.0	124.1	85.0	68.5	161.4	125.1	77.5

Source: Form 41, U.S. Department of Transportation.

TABLE 16

U.S. COMMERCIAL AIR CARRIERS

TOTAL AIR CARGO REVENUE TON MILES

FISCAL YEAR	FREIGHT/EXPRESS RTMS (Millions)			MAIL RTMS (Millions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1995	10,342.1	10,278.0	20,620.1	2,073.6	533.9	2,607.5
1996	10,655.3	10,874.6	21,529.9	2,126.4	560.6	2,687.0
1997	11,177.9	12,926.4	24,104.3	2,276.2	571.8	2,848.0
1998	11,527.3	13,992.9	25,520.2	2,300.8	529.3	2,830.1
1999	11,527.1	13,617.3	25,144.4	2,447.8	509.6	2,957.4
2000E	12,137.0	14,788.5	26,925.5	2,527.6	531.9	3,059.5
Forecast						
2001	12,852.2	16,085.6	28,937.8	2,652.5	547.9	3,200.4
2002	13,540.6	17,355.1	30,895.7	2,769.9	563.6	3,333.5
2003	14,266.1	18,672.0	32,938.1	2,891.4	579.9	3,471.3
2004	15,031.0	20,012.2	35,043.2	3,016.6	596.5	3,613.1
2005	15,836.7	21,389.3	37,226.0	3,146.0	613.5	3,759.5
2006	16,675.3	22,794.8	39,470.1	3,277.8	630.9	3,908.7
2007	17,530.0	24,223.4	41,753.4	3,409.5	648.5	4,058.0
2008	18,398.3	25,704.9	44,103.2	3,540.7	666.9	4,207.6
2009	19,290.2	27,233.1	46,523.3	3,673.0	685.8	4,358.8
2010	20,225.1	28,801.6	49,026.7	3,809.0	705.1	4,514.1
2011	21,204.7	30,395.5	51,600.2	3,949.0	724.9	4,673.9
2012	22,233.0	32,035.1	54,268.1	4,093.1	745.2	4,838.3

* Source: Form 41, U.S. Department of Transportation.

TABLE 17

U.S. COMMERCIAL AIR CARRIERS

AIR CARGO REVENUE TON MILES: ALL-CARGO CARRIERS

FISCAL YEAR	FREIGHT/EXPRESS RTMS (Millions)			MAIL RTMS (Millions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1995	7,458.9	5,286.6	12,745.5	295.4	46.5	341.9
1996	7,954.6	5,909.6	13,864.2	302.1	39.3	341.4
1997	8,486.0	7,315.8	15,801.8	313.7	44.1	357.8
1998	8,906.5	7,985.3	16,891.8	444.9	40.0	484.9
1999	9,027.8	7,288.9	16,316.7	728.9	39.2	768.1
2000E	9,530.2	7,493.3	17,023.5	720.4	37.6	758.0
Forecast						
2001	10,235.2	8,279.6	18,514.8	771.9	38.7	810.6
2002	10,913.5	9,072.3	19,985.8	822.7	39.8	862.5
2003	11,629.0	9,910.6	21,539.6	876.1	41.0	917.1
2004	12,383.8	10,782.5	23,166.3	932.2	42.1	974.3
2005	13,179.3	11,696.2	24,875.5	991.0	43.3	1,034.3
2006	14,007.8	12,647.6	26,655.4	1,052.2	44.6	1,096.8
2007	14,852.4	13,634.7	28,487.1	1,114.9	45.8	1,160.7
2008	15,710.6	14,674.9	30,385.5	1,179.1	47.1	1,226.2
2009	16,592.4	15,765.9	32,358.3	1,245.2	48.5	1,293.7
2010	17,517.2	16,905.1	34,422.3	1,314.1	49.8	1,363.9
2011	18,486.7	18,084.6	36,571.3	1,386.1	51.2	1,437.3
2012	19,504.9	19,317.2	38,822.1	1,461.2	52.7	1,513.9

* Source: Form 41, U.S. Department of Transportation.

TABLE 18

U.S. COMMERCIAL AIR CARRIERS

AIR CARGO REVENUE TON MILES: PASSENGER CARRIERS

FISCAL YEAR	FREIGHT/EXPRESS RTMS (Millions)			MAIL RTMS (Millions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1995	2,883.2	4,991.4	7,874.6	1,778.2	487.4	2,265.6
1996	2,700.7	4,965.0	7,665.7	1,824.3	521.3	2,345.6
1997	2,691.9	5,610.6	8,302.5	1,962.5	527.7	2,490.2
1998	2,620.8	6,007.6	8,628.4	1,855.9	489.3	2,345.2
1999	2,499.3	6,328.4	8,827.7	1,718.9	470.4	2,189.3
2000E	2,606.8	7,295.2	9,902.0	1,807.2	494.3	2,301.5
Forecast						
2001	2,617.0	7,806.0	10,423.0	1,880.6	509.2	2,389.8
2002	2,627.1	8,282.8	10,909.9	1,947.2	523.8	2,471.0
2003	2,637.1	8,761.4	11,398.5	2,015.3	538.9	2,554.2
2004	2,647.2	9,229.7	11,876.9	2,084.4	554.4	2,638.8
2005	2,657.4	9,693.1	12,350.5	2,155.0	570.2	2,725.2
2006	2,667.5	10,147.2	12,814.7	2,225.6	586.3	2,811.9
2007	2,677.6	10,588.7	13,266.3	2,294.6	602.7	2,897.3
2008	2,687.7	11,030.0	13,717.7	2,361.6	619.8	2,981.4
2009	2,697.8	11,467.2	14,165.0	2,427.8	637.3	3,065.1
2010	2,707.9	11,896.5	14,604.4	2,494.9	655.3	3,150.2
2011	2,718.0	12,310.9	15,028.9	2,562.9	673.7	3,236.6
2012	2,728.1	12,717.9	15,446.0	2,631.9	692.5	3,324.4

* Source: Form 41, U.S. Department of Transportation.

TABLE 19

U.S. COMMERCIAL AIR CARRIERS

PASSENGER JET AIRCRAFT

CALENDAR YEAR	LARGE NARROWBODY			LARGE WIDEBODY			REGIONAL JETS	TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE		
Historical								
1995	2,715	522	44	248	256	112	35	3,932
1996	2,810	537	47	262	258	143	62	4,119
1997	2,824	532	37	288	243	139	10	4,073
1998	2,949	508	32	309	226	122	221	4,367
1999	3,139	436	21	361	204	129	365	4,655
2000E	3,299	378	19	432	171	118	547	4,964
Forecast								
2001	3,413	293	19	478	149	116	702	5,170
2002	3,554	230	19	510	136	113	848	5,410
2003	3,680	176	19	543	124	115	997	5,654
2004	3,816	118	19	571	118	119	1,110	5,871
2005	3,935	115	19	609	105	123	1,225	6,131
2006	4,069	116	19	637	98	125	1,346	6,410
2007	4,199	118	19	667	91	126	1,499	6,719
2008	4,376	120	19	697	84	127	1,657	7,080
2009	4,569	122	19	729	78	129	1,800	7,446
2010	4,743	124	19	767	71	131	1,941	7,796
2011	4,924	125	19	808	58	134	2,071	8,139
2012	5,129	127	19	840	58	140	2,190	8,503

TABLE 20

U.S. COMMERCIAL AIR CARRIERS

CARGO JET AIRCRAFT

CALENDAR YEAR	LARGE NARROWBODY			LARGE WIDEBODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical							
1995	138	326	200	38	57	65	824
1996	149	319	201	66	72	43	850
1997	160	322	199	86	111	40	918
1998	166	326	197	111	123	44	967
1999	172	338	185	134	147	53	1,029
2000E	167	339	178	160	166	63	1,073
Forecast							
2001	169	340	175	178	170	67	1,099
2002	177	342	176	205	181	71	1,152
2003	184	343	176	233	193	74	1,203
2004	193	344	176	266	205	76	1,260
2005	203	345	177	298	218	78	1,319
2006	214	346	177	332	231	80	1,380
2007	226	347	177	369	244	82	1,445
2008	238	348	177	401	257	84	1,505
2009	250	348	177	438	270	86	1,569
2010	262	348	177	478	282	88	1,635
2011	274	348	178	513	295	90	1,698
2012	286	348	178	548	308	92	1,760

TABLE 21

U.S. COMMERCIAL AIR CARRIERS

TOTAL AIRBORNE HOURS 1/

(In Thousands)

FISCAL YEAR	LARGE NARROWBODY			LARGE WIDEBODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical							
1995	7,649	1,583	312	980	938	558	12,020
1996	8,042	1,504	314	1,021	945	555	12,381
1997	8,430	1,472	293	1,149	940	530	12,814
1998	8,661	1,477	259	1,285	942	511	13,135
1999	9,195	1,385	249	1,489	908	503	13,728
2000E	9,885	1,206	196	1,756	847	504	14,394
Forecast							
2001	10,266	1,025	200	1,902	829	503	14,725
2002	10,756	915	201	2,074	840	506	15,292
2003	11,193	830	201	2,212	840	510	15,786
2004	11,670	739	201	2,385	824	527	16,346
2005	12,094	736	202	2,585	824	543	16,984
2006	12,571	739	202	2,762	806	554	17,634
2007	13,038	744	202	2,953	821	562	18,320
2008	13,659	749	202	3,129	818	570	19,127
2009	14,333	752	202	3,326	835	581	20,029
2010	14,945	755	202	3,548	830	591	20,871
2011	15,579	757	203	3,765	830	605	21,739
2012	16,293	760	203	3,956	860	626	22,698

Source: Form 41, U.S. Department of Transportation.
1/ Includes both passenger (excluding regional jets) and cargo aircraft.

TABLE 22

TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION

U.S. CIVIL AVIATION AIRCRAFT

(Millions of Gallons)

FISCAL YEAR	JET FUEL					AVIATION GASOLINE			TOTAL FUEL CONSUMED
	U.S. AIR CARRIERS 1/			GENERAL AVIATION	TOTAL	AIR CARRIER	GENERAL AVIATION	TOTAL	
	DOMESTIC	INT'L.	TOTAL						
Historical*									
1995	12,652	4,417	17,069	560	17,629	2	287	289	17,918
1996	13,022	4,557	17,579	608	18,187	2	289	291	18,478
1997	13,429	4,818	18,247	642	18,889	2	292	294	19,183
1998	13,754	5,128	18,882	815	19,697	2	311	313	20,010
1999	14,243	5,186	19,429	967	20,396	2	345	347	20,744
2000E	14,742	5,433	20,175	1,035	21,211	2	347	349	21,560
Forecast									
2001	15,333	5,849	21,182	1,111	22,293	2	352	354	22,646
2002	15,862	6,234	22,095	1,200	23,295	2	357	359	23,653
2003	16,473	6,641	23,114	1,291	24,405	2	362	364	24,769
2004	17,035	7,057	24,092	1,383	25,475	2	367	369	25,844
2005	17,658	7,448	25,106	1,469	26,575	2	372	374	26,949
2006	18,335	7,853	26,188	1,558	27,746	2	377	379	28,125
2007	19,047	8,265	27,312	1,649	28,960	2	382	384	29,344
2008	19,767	8,714	28,481	1,739	30,220	2	387	389	30,609
2009	20,494	9,179	29,673	1,827	31,499	2	391	393	31,893
2010	21,248	9,678	30,926	1,915	32,841	2	396	398	33,239
2011	22,032	10,174	32,206	2,004	34,210	2	400	402	34,611
2012	22,843	10,674	33,517	2,095	35,612	2	404	406	36,017

* Source: Air carrier jet fuel, Form 41, U.S. Department of Transportation; all others, FAA APO estimates.
1/ Includes both passenger and cargo carriers.

TABLE 23

U.S. REGIONALS/COMMUTERS FORECAST ASSUMPTIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT			AVERAGE PASSENGER TRIP LENGTH			FORM 41 REVENUE PER PASSENGER MILE	
	298-C CARRIERS (Seats)	FORM 41 CARRIERS (Seats)	ALL CARRIERS (Seats)	298-C CARRIERS (Miles)	FORM 41 CARRIERS (Miles)	ALL CARRIERS (Miles)	CURRENT $ (Cents)	2000$ (Cents)
Historical*								
1995	27.7	36.1	30.3	215.2	211.0	213.6	37.05	38.75
1996	27.8	35.0	30.5	224.3	220.7	222.7	38.68	41.02
1997	28.3	37.3	31.4	229.1	226.0	227.8	40.91	41.81
1998	28.9	40.7	33.2	240.9	237.2	239.2	41.35	42.95
1999	31.2	42.7	35.9	253.4	254.7	254.0	36.19	36.38
2000E	30.9	44.9	37.5	260.9	295.6	280.4	33.75	33.75
Forecast								
2001	30.0	46.0	38.6	250.0	315.0	290.2	34.73	33.75
2002	31.0	47.0	39.7	255.0	321.0	295.9	35.56	33.71
2003	32.0	48.0	40.7	260.0	327.0	301.7	36.17	33.41
2004	32.5	49.0	41.5	265.0	333.0	307.5	36.60	32.91
2005	33.0	49.5	42.1	268.0	338.0	311.9	36.93	32.35
2006	33.5	50.0	42.6	271.0	343.0	316.2	37.23	31.74
2007	34.0	50.5	43.2	274.0	348.0	320.6	37.52	31.14
2008	34.5	51.0	43.8	277.0	353.0	325.0	37.82	30.58
2009	35.0	51.5	44.3	280.0	357.0	328.7	38.13	30.00
2010	35.5	52.0	44.9	282.0	361.0	332.1	38.43	29.46
2011	36.0	52.5	45.4	284.0	365.0	335.4	38.74	28.90
2012	36.5	53.0	46.0	286.0	369.0	338.8	39.05	28.35

* Source: Forms 298-C and 41, U.S. Department of Transportation.

TABLE 24

U.S. REGIONALS/COMMUTERS

SCHEDULED PASSENGER TRAFFIC

(In Millions)

FISCAL YEAR	REVENUE PASSENGERS			REVENUE PASSENGER MILES		
	298-C CARRIERS 1/	FORM 41 CARRIERS 2/	ALL CARRIERS	298-C CARRIERS	FORM 41 CARRIERS	ALL CARRIERS
Historical*						
1995	34.8	21.0	55.8	7,494.7	4,426.4	11,921.1
1996	33.7	26.3	60.0	7,550.0	5,807.1	13,357.1
1997	36.1	26.2	62.3	8,280.8	5,930.3	14,211.1
1998	35.4	30.5	65.9	8,531.4	9,224.0	17,755.4
1999	36.8	37.5	74.3	9,326.4	9,544.0	18,870.4
2000E	34.8	44.7	79.6	9,085.4	13,227.5	22,312.9
Forecast						
2001	32.7	52.8	85.5	8,166.5	16,636.4	24,802.9
2002	34.6	56.5	91.1	8,814.6	18,131.4	26,946.0
2003	36.5	60.3	96.8	9,497.3	19,708.9	29,206.2
2004	38.6	64.2	102.8	10,216.8	21,373.3	31,590.1
2005	40.6	68.2	108.8	10,892.6	23,058.7	33,951.3
2006	42.8	72.3	115.1	11,592.0	24,811.2	36,403.2
2007	44.9	76.4	121.3	12,303.7	26,603.6	38,907.3
2008	47.0	80.5	127.5	13,025.9	28,431.7	41,457.6
2009	49.2	84.7	133.9	13,765.4	30,227.5	43,992.9
2010	51.4	88.9	140.3	14,484.1	32,099.8	46,583.9
2011	53.6	93.3	146.9	15,228.9	34,049.4	49,278.3
2012	56.0	97.8	153.7	16,001.7	36,080.8	52,082.5

* Source: Forms 298-C and 41, U.S. Department of Transportation.

1/ Origin and destination passengers (includes estimates of connecting passengers for Comair and Atlantic Coast).

2/ Enplanements

TABLE 25

U.S. REGIONALS/COMMUTERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

FISCAL YEAR	298-C CARRIERS			FORM 41 CARRIERS		
	ASMs (MIL)	RPMs (MIL)	% LOAD FACTOR	ASMs (MIL)	RPMs (MIL)	% LOAD FACTOR
Historical*						
1995	15,414.5	7,494.7	48.6	8,779.3	4,426.4	50.4
1996	14,667.9	7,550.0	51.5	10,884.0	5,808.1	53.4
1997	15,650.6	8,280.8	52.9	10,869.8	5,930.3	54.6
1998	15,529.2	8,531.4	54.9	12,363.8	7,224.0	58.4
1999	16,802.3	9,326.4	55.5	15,989.2	9,544.2	59.7
2000E	16,473.2	9,085.4	55.2	21,335.0	13,227.5	62.0
Forecast						
2001	14,984.4	8,166.5	54.5	26,618.3	16,636.4	62.5
2002	16,085.0	8,814.6	54.8	28,779.9	18,131.4	63.0
2003	17,236.5	9,497.3	55.1	31,086.7	19,708.9	63.4
2004	18,441.9	10,216.8	55.4	33,500.4	21,373.3	63.8
2005	19,591.0	10,892.6	55.6	35,973.0	23,058.7	64.1
2006	20,774.2	11,592.0	55.8	38,526.8	24,811.2	64.4
2007	21,970.9	12,303.7	56.0	41,118.3	26,603.6	64.7
2008	23,177.8	13,025.9	56.2	43,808.4	28,431.7	64.9
2009	24,406.7	13,765.4	56.4	46,432.5	30,227.5	65.1
2010	25,590.3	14,484.1	56.6	49,157.4	32,099.8	65.3
2011	26,811.4	15,228.9	56.8	51,983.8	34,049.4	65.5
2012	28,073.2	16,001.7	57.0	54,917.5	36,080.8	65.7

Source: Form 41, U.S. Department of Transportation.

TABLE 26

U.S. REGIONALS/COMMUTERS

PASSENGER AIRCRAFT AND FLIGHT HOURS

AS OF JANUARY 1	REGIONAL/COMMUTER AIRCRAFT						FLIGHT HOURS (000)
	LESS THAN 10 SEATS	10 TO 20 SEATS	21 TO 40 SEATS	41 TO 60 SEATS	61 to 70 SEATS	TOTAL	
Historical*							
1995	535	681	661	153	79	2,109	3,817
1996	535	576	737	177	83	2,108	3,683
1997	479	576	707	203	87	2,052	3,685
1998	468	517	716	321	95	2,117	3,590
1999	411	469	758	428	109	2,175	3,718
2000E	400	452	785	559	116	2,312	3,805
Forecast							
2001	390	437	811	645	153	2,436	3,984
2002	381	424	827	735	190	2,557	4,158
2003	372	411	857	818	218	2,676	4,337
2004	364	400	867	901	228	2,760	4,557
2005	356	389	873	984	349	2,951	4,802
2006	349	379	878	1,067	277	2,950	5,050
2007	342	369	906	1,164	300	3,081	5,296
2008	336	360	923	1,271	328	3,218	5,543
2009	330	351	938	1,373	348	3,340	5,778
2010	324	343	951	1,470	369	3,457	6,020
2011	319	335	962	1,562	394	3,572	6,266
2012	314	328	972	1,639	420	3,673	6,519

*Source: Fleet; FAA Aircraft Utilization and Propulsion Reliability Report.
Flight Hours; Forms 298-C and 41, U.S. Department of Transportation.

TABLE 27

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

AS OF DECEMBER 31	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	OTHER	TOTAL
	PISTON		TURBINE						
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBO JET	PISTON	TURBINE			
Historical*									
1995 1/	137,049	15,739	4,995	4,559	1,863	3,967	15,176	4,741	188,089
1996 1/	137,401	16,150	5,716	4,424	2,507	4,063	16,625	4,244	191,129
1997 1/	140,038	16,017	5,619	5,178	2,259	4,526	14,680	4,092	192,414
1998	144,234	18,729	6,174	6,066	2,545	4,881	16,502	5,580	204,710
1999	150,886	21,038	5,679	7,120	2,564	4,884	20,528	6,765	219,464
2000E	151,640	21,143	5,736	7,440	2,692	4,957	20,780	6,825	221,213
Forecast									
2001	152,850	21,200	5,820	7,790	2,855	5,055	21,030	6,885	223,485
2002	154,100	21,200	5,900	8,240	2,970	5,130	21,290	6,945	225,775
2003	155,350	21,200	5,990	8,690	3,060	5,210	21,550	7,005	228,055
2004	156,550	21,200	6,060	9,140	3,120	5,290	21,820	7,065	230,245
2005	157,800	21,200	6,140	9,580	3,185	5,365	22,090	7,125	232,485
2006	158,800	21,200	6,220	10,000	3,245	5,445	22,360	7,185	234,455
2007	159,800	21,200	6,280	10,450	3,295	5,530	22,640	7,245	236,440
2008	160,800	21,200	6,350	10,880	3,345	5,615	22,920	7,305	238,415
2009	161,800	21,200	6,410	11,300	3,395	5,695	23,210	7,365	240,375
2010	162,800	21,200	6,470	11,720	3,430	5,780	23,500	7,425	242,325
2011	163,800	21,200	6,530	12,130	3,465	5,870	23,790	7,485	244,270
2012	164,800	21,200	6,600	12,280	3,500	5,960	24,080	7,545	245,965

* Source: 1995-1999, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

TABLE 28

ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN

(In Thousands)

CALENDAR YEAR	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	OTHER	TOTAL
	PISTON		TURBINE						
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE			
Historical*									
1995 1/	17,831	2,420	1,490	1,455	337	1,624	1,194	261	26,612
1996 1/	17,606	2,485	1,768	1,543	591	1,531	1,158	227	26,909
1997 1/	18,345	2,399	1,655	1,713	344	1,740	1,327	192	27,713
1998	16,823	3,578	1,765	2,226	430	1,912	1,071	295	28,100
1999	19,325	3,569	1,811	2,738	556	2,188	1,247	318	31,752
2000E	19,425	3,577	1,827	2,939	564	2,221	1,261	321	32,135
Forecast									
2001	19,730	3,590	1,855	3,195	590	2,275	1,285	325	32,845
2002	20,110	3,600	1,885	3,500	610	2,335	1,315	330	33,685
2003	20,510	3,610	1,915	3,815	620	2,390	1,340	335	34,535
2004	20,900	3,620	1,945	4,130	635	2,455	1,370	340	35,395
2005	21,300	3,630	1,970	4,425	655	2,510	1,395	345	36,230
2006	21,680	3,640	2,000	4,730	670	2,570	1,425	350	37,065
2007	22,050	3,650	2,020	5,045	680	2,630	1,455	355	37,885
2008	22,400	3,660	2,045	5,355	690	2,695	1,485	360	38,690
2009	22,730	3,670	2,065	5,660	705	2,755	1,515	365	39,465
2010	23,040	3,680	2,085	5,965	715	2,820	1,545	370	40,220
2011	23,340	3,690	2,105	6,270	720	2,890	1,575	375	40,965
2012	23,650	3,700	2,130	6,585	730	2,955	1,605	380	41,735

* Source: 1995-1999, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

Note: An active aircraft is one that has a current registration and was flown at least one hour during the previous calendar year.

TABLE 29

ACTIVE PILOTS BY TYPE OF CERTIFICATE

AS OF DECEMBER 31	STUDENTS	RECREA-TIONAL	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	ROTORCRAFT ONLY	GLIDER ONLY	TOTAL	INSTRUMENT RATED 1/
Historical*									
1995	101,279	232	261,399	133,980	123,877	7,183	11,234	639,184	298,798
1996	94,947	265	254,002	129,187	127,486	6,961	9,413	622,261	297,895
1997	96,101	284	247,604	125,300	130,858	6,801	9,394	616,342	297,409
1998	97,736	305	247,226	122,053	134,612	6,964	9,402	618,298	300,183
1999	97,359	343	258,749	124,261	137,642	7,728	9,390	635,472	308,951
2000E	104,150	344	260,700	126,200	139,700	8,015	9,430	648,539	315,100
Forecast									
2001	107,600	349	267,400	128,400	144,400	8,290	9,465	665,904	321,400
2002	110,500	353	272,000	130,600	149,500	8,490	9,505	680,948	327,800
2003	113,500	358	277,500	133,300	154,400	8,665	9,540	697,263	333,700
2004	116,600	362	283,700	136,300	159,300	8,775	9,580	714,617	339,700
2005	119,700	367	288,000	138,300	164,000	8,895	9,620	728,882	345,500
2006	122,900	371	291,400	139,900	169,300	9,045	9,660	742,576	351,000
2007	126,200	375	294,600	141,500	174,400	9,200	9,690	755,965	356,600
2008	129,600	380	297,600	142,900	180,000	9,355	9,730	769,565	361,900
2009	133,100	384	300,600	144,300	186,000	9,505	9,775	783,664	367,300
2010	136,700	389	303,600	145,800	192,000	9,630	9,810	797,929	372,800
2011	140,400	393	306,600	147,300	198,100	9,760	9,850	812,403	378,400
2012	144,200	397	309,600	148,800	204,400	9,890	9,890	827,177	384,100

* Source: FAA U.S. Civil Aviation Registry.
1/ Instrument rated pilots should not be added to other categories in deriving total.
E: Estimate
Note: An active pilot is a person with a pilot certificate and a valid medical certificate.

TABLE 30

GENERAL AVIATION AIRCRAFT FUEL CONSUMPTION

(In Millions of Gallons)

CALENDAR YEAR	FIXED WING				ROTORCRAFT		OTHER/ EXPERI-MENTAL	TOTAL FUEL CONSUMED		
	PISTON		TURBINE							
	SINGLE ENGINE	MULTI-ENGINE	TURBO-PROP	TURBO-JET	PISTON	TURBINE		AVGAS	JET FUEL	TOTAL
Historical										
1995	192.6	73.8	124.4	388.0	5.1	47.4	15.8	287.3	559.8	847.1
1996	188.4	75.9	145.0	419.2	8.9	43.5	15.3	288.5	607.7	896.2
1997	196.3	73.2	135.7	456.9	5.2	49.4	17.5	292.2	642.0	934.2
1998	181.8	109.6	149.1	608.8	6.5	56.8	13.4	311.3	814.7	1,126.0
1999	209.9	111.6	153.3	750.8	8.4	63.2	15.5	345.4	967.3	1,312.7
2000E	210.9	112.1	154.8	816.4	8.5	64.2	15.6	347.1	1,035.4	1,382.5
Forecast										
2001	214.2	112.5	157.2	887.5	8.9	65.8	15.9	351.5	1,110.5	1,462.0
2002	218.3	112.9	159.7	972.2	9.2	67.5	16.3	356.7	1,199.4	1,556.1
2003	222.7	113.2	162.3	1,059.7	9.4	69.1	16.6	361.9	1,291.1	1,653.0
2004	226.9	113.5	164.8	1,147.2	9.6	71.0	17.0	367.0	1,383.0	1,750.0
2005	231.3	113.8	166.9	1,229.2	9.9	72.5	17.3	372.3	1,468.6	1,840.9
2006	235.4	114.1	169.5	1,313.9	10.1	74.3	17.7	377.3	1,557.7	1,935.0
2007	239.4	114.4	171.2	1,401.4	10.3	76.0	18.0	382.1	1,648.6	2,030.7
2008	243.2	114.7	173.3	1,487.5	10.4	77.9	18.4	386.7	1,738.7	2,125.4
2009	246.8	115.0	175.0	1,572.2	10.6	79.6	18.8	391.2	1,826.8	2,218.0
2010	250.2	115.4	176.7	1,656.9	10.8	81.5	19.1	395.5	1,915.1	2,310.6
2011	253.4	115.7	178.4	1,741.7	10.9	83.5	19.5	399.5	2,003.6	2,403.1
2012	256.8	116.0	180.5	1,829.2	11.0	85.4	19.9	403.7	2,095.1	2,498.8

Source: FAA APO Estimates.
Note: Detail may not add to total because of independent rounding.

TABLE 31

ACTIVE ROTORCRAFT FLEET AND HOURS FLOWN

CALENDAR YEAR	ACTIVE FLEET			HOURS FLOWN (Thousands)		
	PISTON	TURBINE	TOTAL	PISTON	TURBINE	TOTAL
Historical*						
1995 1/	1,863	3,967	5,830	337	1,624	1,961
1996 1/	2,507	4,063	6,570	591	1,531	2,122
1997 1/	2,259	4,526	6,785	344	1,740	2,084
1998	2,545	4,881	7,426	430	1,912	2,342
1999	2,564	4,884	7,448	556	2,188	2,744
2000E	2,692	4,957	7,649	564	2,221	2,785
Forecast						
2001	2,855	5,055	7,910	590	2,275	2,865
2002	2,970	5,130	8,100	610	2,335	2,945
2003	3,060	5,210	8,270	620	2,390	3,010
2004	3,120	5,290	8,410	635	2,455	3,090
2005	3,185	5,365	8,550	655	2,510	3,165
2006	3,245	5,445	8,690	670	2,570	3,240
2007	3,295	5,530	8,825	680	2,630	3,310
2008	3,345	5,615	8,960	690	2,695	3,385
2009	3,395	5,695	9,090	705	2,755	3,460
2010	3,430	5,780	9,210	715	2,820	3,535
2011	3,465	5,870	9,335	720	2,890	3,610
2012	3,500	5,960	9,460	730	2,955	3,685

* Source: 1995-1999, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.
1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.
Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

TABLE 32

TOTAL COMBINED AIRCRAFT OPERATIONS AT AIRPORTS

WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	NUMBER OF TOWERS**	
						FAA	CONTRACT
Historical*							
1995	13,647.4	10,234.2	35,926.6	2,612.3	62,420.5	326	95
1996	13,893.3	10,170.4	35,298.3	2,546.9	61,908.9	318	128
1997	14,256.7	10,052.7	36,833.3	2,523.6	63,666.3	288	160
1998	14,258.0	10,172.2	38,046.7	2,781.4	65,258.3	287	161
1999	14,582.4	10,576.0	40,040.9	2,950.8	68,150.1	288	166
2000E	15,158.1	10,761.3	39,851.0	2,915.1	68,685.5	267	192
Forecast							
2001	15,565.1	11,070.3	41,353.6	3,017.0	71,006.0	267	221
2002	16,043.9	11,426.1	43,725.6	3,223.5	74,419.1	267	221
2003	16,542.8	11,620.3	44,537.6	3,223.5	75,924.2	267	221
2004	17,037.5	11,806.3	45,383.8	3,223.5	77,451.1	267	221
2005	17,608.2	12,089.6	46,239.6	3,223.5	79,160.9	267	221
2006	18,192.8	12,367.7	47,111.8	3,223.5	80,895.8	267	221
2007	18,736.8	12,676.9	47,980.0	3,223.5	82,617.2	267	221
2008	19,302.6	13,019.2	48,837.0	3,223.5	84,382.3	267	221
2009	19,887.5	13,344.6	49,688.3	3,223.5	86,143.9	267	221
2010	20,496.1	13,678.2	50,504.7	3,223.5	87,902.5	267	221
2011	21,121.2	14,006.5	51,334.6	3,223.5	89,685.8	267	221
2012	21,771.7	14,342.7	52,156.0	3,223.5	91,493.9	267	221

* Source: FAA Air Traffic Activity.

TABLE 33

COMBINED ITINERANT AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	13,647.4	10,234.2	20,860.4	1,331.6	46,073.6
1996	13,893.3	10,170.4	20,823.0	1,311.4	46,198.1
1997	14,256.7	10,052.7	21,669.1	1,276.5	47,255.0
1998	14,258.0	10,172.2	22,086.6	1,354.4	47,871.2
1999	14,582.4	10,576.0	23,042.0	1,441.8	49,642.2
2000E	15,158.1	10,761.3	22,848.4	1,439.2	50,207.0
Forecast					
2001	15,565.1	11,070.3	23,751.1	1,471.5	51,858.0
2002	16,043.9	11,426.1	24,939.9	1,536.3	53,946.2
2003	16,542.8	11,620.3	25,413.7	1,536.3	55,113.1
2004	17,037.5	11,806.3	25,896.6	1,536.3	56,276.7
2005	17,608.2	12,089.6	26,362.7	1,536.3	57,596.8
2006	18,192.8	12,367.7	26,837.3	1,536.3	58,934.1
2007	18,736.8	12,676.9	27,320.3	1,536.3	60,270.3
2008	19,302.6	13,019.2	27,784.8	1,536.3	61,642.9
2009	19,887.5	13,344.6	28,257.1	1,536.3	63,025.5
2010	20,496.1	13,678.2	28,709.2	1,536.3	64,419.8
2011	21,121.2	14,006.5	29,168.6	1,536.3	65,832.6
2012	21,771.7	14,342.7	29,635.3	1,536.3	67,286.0

* Source: FAA Air Traffic Activity.

TABLE 34

COMBINED LOCAL AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1995	15,066.2	1,280.7	16,346.9
1996	14,475.3	1,235.5	15,710.8
1997	15,164.2	1,247.1	16,411.3
1998	15,960.1	1,427.0	17,387.1
1999	16,998.9	1,509.0	18,507.9
2000E	17,002.6	1,475.9	18,478.5
Forecast			
2001	17,602.5	1,545.5	19,148.0
2002	18,785.7	1,687.2	20,472.9
2003	19,123.9	1,687.2	20,811.1
2004	19,487.2	1,687.2	21,174.4
2005	19,876.9	1,687.2	21,564.1
2006	20,274.5	1,687.2	21,961.7
2007	20,659.7	1,687.2	22,346.9
2008	21,052.2	1,687.2	22,739.4
2009	21,431.2	1,687.2	23,118.4
2010	21,795.5	1,687.2	23,482.7
2011	22,166.0	1,687.2	23,853.2
2012	22,520.7	1,687.2	24,207.9

* Source: FAA Air Traffic Activity.

TABLE 35

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	13,589.7	9,823.8	32,265.6	2,294.8	57,973.9
1996	13,768.1	9,314.9	29,249.1	2,077.7	54,409.8
1997	14,112.0	8,968.8	28,232.5	1,942.9	53,256.2
1998	14,101.7	8,928.1	27,929.0	2,028.8	52,987.6
1999	14,423.8	9,318.1	29,144.7	2,181.9	55,068.5
2000E	14,920.6	9,218.0	26,973.4	2,059.6	53,171.6
Forecast					
2001	15,313.7	9,420.8	27,449.7	2,059.6	54,243.8
2002	15,768.5	9,599.8	27,934.1	2,059.6	55,362.0
2003	16,258.9	9,763.0	28,453.9	2,059.6	56,535.4
2004	16,745.0	9,919.2	28,994.5	2,059.6	57,718.4
2005	17,306.0	10,157.3	29,539.1	2,059.6	59,061.9
2006	17,880.5	10,390.9	30,093.9	2,059.6	60,424.9
2007	18,415.2	10,650.6	30,647.4	2,059.6	61,772.8
2008	18,971.3	10,938.2	31,192.5	2,059.6	63,161.6
2009	19,546.1	11,211.7	31,735.0	2,059.6	64,552.4
2010	20,144.2	11,492.0	32,255.2	2,059.6	65,951.0
2011	20,758.6	11,767.8	32,783.9	2,059.6	67,370.0
2012	21,398.0	12,050.2	33,308.5	2,059.6	68,816.3

* Source: FAA Air Traffic Activity.

TABLE 36

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	13,589.7	9,823.8	18,886.4	1,190.5	43,490.4
1996	13,768.1	9,314.9	17,574.5	1,099.2	41,756.7
1997	14,112.0	8,968.8	17,097.3	1,015.4	41,193.5
1998	14,101.7	8,928.1	16,846.2	1,052.3	40,928.3
1999	14,423.8	9,318.1	17,440.8	1,118.7	42,301.4
2000E	14,920.6	9,218.0	16,284.9	1,091.2	41,514.7
Forecast					
2001	15,313.7	9,420.8	16,675.7	1,091.2	42,501.4
2002	15,768.5	9,599.8	17,009.3	1,091.2	43,468.7
2003	16,258.9	9,763.0	17,332.4	1,091.2	44,445.5
2004	16,745.0	9,919.2	17,661.7	1,091.2	45,417.2
2005	17,306.0	10,157.3	17,979.7	1,091.2	46,534.1
2006	17,880.5	10,390.9	18,303.3	1,091.2	47,665.9
2007	18,415.2	10,650.6	18,632.7	1,091.2	48,789.8
2008	18,971.3	10,938.2	18,949.5	1,091.2	49,950.2
2009	19,546.1	11,211.7	19,271.6	1,091.2	51,120.6
2010	20,144.2	11,492.0	19,580.0	1,091.2	52,307.4
2011	20,758.6	11,767.8	19,893.3	1,091.2	53,510.9
2012	21,398.0	12,050.2	20,211.6	1,091.2	54,751.0

* Source: FAA Air Traffic Activity.

TABLE 37

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1995	13,379.2	1,104.3	14,483.5
1996	11,674.6	978.5	12,653.1
1997	11,135.2	927.5	12,062.7
1998	11,082.8	976.5	12,059.3
1999	11,703.9	1,063.2	12,767.1
2000E	10,688.5	968.4	11,656.9
Forecast			
2001	10,774.0	968.4	11,742.4
2002	10,924.8	968.4	11,893.2
2003	11,121.5	968.4	12,089.9
2004	11,332.8	968.4	12,301.2
2005	11,559.5	968.4	12,527.9
2006	11,790.6	968.4	12,759.0
2007	12,014.7	968.4	12,983.1
2008	12,242.9	968.4	13,211.3
2009	12,463.3	968.4	13,431.7
2010	12,675.2	968.4	13,643.6
2011	12,890.7	968.4	13,859.1
2012	13,096.9	968.4	14,065.3

* Source: FAA Air Traffic Activity.

TABLE 38

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	57.7	410.4	3,661.0	317.5	4,446.6
1996	125.2	855.5	6,049.2	469.2	7,499.1
1997	144.7	1,083.9	8,600.8	580.7	10,410.1
1998	156.3	1,244.1	10,117.7	752.6	12,270.7
1999	158.6	1,257.9	10,896.2	768.9	13,081.6
2000E	237.5	1,543.3	12,877.6	855.5	15,513.9
Forecast					
2001	251.5	1,649.5	13,903.8	957.4	16,762.1
2002	275.4	1,826.3	15,791.5	1,163.9	19,057.1
2003	284.0	1,857.4	16,083.7	1,163.9	19,388.9
2004	292.4	1,887.1	16,389.2	1,163.9	19,732.7
2005	302.2	1,932.4	16,700.6	1,163.9	20,099.1
2006	312.3	1,976.8	17,017.8	1,163.9	20,470.8
2007	321.6	2,026.2	17,332.6	1,163.9	20,844.4
2008	331.3	2,080.9	17,644.6	1,163.9	21,220.7
2009	341.4	2,133.0	17,953.3	1,163.9	21,591.6
2010	351.8	2,186.3	18,249.5	1,163.9	21,951.6
2011	362.5	2,238.8	18,550.7	1,163.9	22,315.9
2012	373.7	2,292.5	18,847.5	1,163.9	22,677.6

* Source: FAA Air Traffic Activity.
Note: Detail may not add to total because of rounding.

TABLE 39

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	57.7	410.4	1,974.0	141.1	2,583.2
1996	125.2	855.5	3,248.5	212.2	4,441.4
1997	144.7	1,083.9	4,571.8	261.1	6,061.5
1998	156.3	1,244.1	5,240.4	302.1	6,942.9
1999	158.6	1,257.9	5,601.2	323.1	7,340.8
2000E	237.5	1,543.3	6,563.5	348.0	8,692.3
Forecast					
2001	251.5	1,649.5	7,075.4	380.3	9,356.6
2002	275.4	1,826.3	7,930.6	445.1	10,477.4
2003	284.0	1,857.4	8,081.3	445.1	10,667.7
2004	292.4	1,887.1	8,234.8	445.1	10,859.5
2005	302.2	1,932.4	8,383.1	445.1	11,062.8
2006	312.3	1,976.8	8,534.0	445.1	11,268.2
2007	321.6	2,026.2	8,687.6	445.1	11,480.5
2008	331.3	2,080.9	8,835.3	445.1	11,692.6
2009	341.4	2,133.0	8,985.5	445.1	11,904.9
2010	351.8	2,186.3	9,129.2	445.1	12,112.4
2011	362.5	2,238.8	9,275.3	445.1	12,321.7
2012	373.7	2,292.5	9,423.7	445.1	12,535.0

* Source: FAA Air Traffic Activity.

TABLE 40

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1995	1,687.0	176.4	1,863.4
1996	2,800.7	257.0	3,057.7
1997	4,029.0	319.6	4,348.6
1998	4,877.3	450.5	5,327.8
1999	5,295.0	445.8	5,740.8
2000E	6,314.1	507.5	6,821.6
Forecast			
2001	6,828.5	577.1	7,405.6
2002	7,860.9	718.8	8,579.7
2003	8,002.4	718.8	8,721.2
2004	8,154.4	718.8	8,873.2
2005	8,317.5	718.8	9,036.3
2006	8,483.8	718.8	9,202.7
2007	8,645.0	718.8	9,363.9
2008	8,809.3	718.8	9,528.1
2009	8,967.9	718.8	9,686.7
2010	9,120.3	718.8	9,839.1
2011	9,275.4	718.8	9,994.2
2012	9,423.8	718.8	10,142.6

* Source: FAA Air Traffic Activity.

TABLE 41

TOTAL COMBINED INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	14,653.2	10,950.4	18,216.3	3,570.2	47,390.1
1996	14,871.5	10,932.7	18,085.9	3,327.1	47,217.2
1997	15,388.1	11,020.9	19,087.9	3,282.0	48,778.9
1998	15,405.1	11,220.7	19,931.0	3,423.7	49,980.5
1999	15,833.1	11,586.7	20,897.8	3,512.3	51,829.9
2000E	16,529.6	11,624.6	21,274.3	3,569.1	52,997.6
Forecast					
2001	16,961.3	11,880.3	21,699.8	3,569.1	54,110.5
2002	17,465.0	12,106.1	22,112.1	3,569.1	55,252.3
2003	18,008.2	12,311.9	22,554.3	3,569.1	56,443.5
2004	18,546.6	12,508.9	23,050.5	3,569.1	57,675.1
2005	19,167.9	12,809.1	23,511.5	3,569.1	59,057.6
2006	19,804.3	13,103.7	23,981.8	3,569.1	60,458.9
2007	20,396.5	13,431.3	24,461.4	3,569.1	61,858.3
2008	21,012.4	13,793.9	24,926.2	3,569.1	63,301.6
2009	21,649.1	14,138.8	25,374.8	3,569.1	64,731.8
2010	22,311.6	14,492.2	25,831.6	3,569.1	66,204.5
2011	22,992.1	14,840.0	26,270.7	3,569.1	67,671.9
2012	23,700.2	15,196.2	26,743.6	3,569.1	69,209.1

* Source: FAA Air Traffic Activity.

TABLE 42

INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	14,626.3	10,785.7	18,092.0	3,544.4	47,048.4
1996	14,789.4	10,662.3	17,889.3	3,287.6	46,628.6
1997	15,298.0	10,730.9	18,863.7	3,235.6	48,128.2
1998	15,309.9	10,916.3	19,678.6	3,368.0	49,272.8
1999	15,742.3	11,270.0	20,643.7	3,454.2	51,110.2
2000E	16,403.8	11,244.3	20,997.1	3,507.6	52,152.8
Forecast					
2001	16,832.5	11,491.7	21,417.0	3,507.6	53,248.8
2002	17,332.4	11,710.0	21,824.0	3,507.6	54,374.0
2003	17,871.4	11,909.1	22,260.4	3,507.6	55,548.5
2004	18,405.8	12,099.6	22,750.2	3,507.6	56,763.2
2005	19,022.4	12,390.0	23,205.2	3,507.6	58,125.2
2006	19,653.9	12,675.0	23,669.3	3,507.6	59,505.8
2007	20,241.6	12,991.9	24,142.7	3,507.6	60,883.7
2008	20,852.9	13,342.6	24,601.4	3,507.6	62,304.5
2009	21,484.7	13,676.2	25,044.2	3,507.6	63,712.7
2010	22,142.1	14,018.1	25,495.0	3,507.6	65,162.8
2011	22,817.5	14,354.6	25,928.4	3,507.6	66,608.0
2012	23,520.2	14,699.1	26,395.1	3,507.6	68,122.0

* Source: FAA Air Traffic Activity.

TABLE 43

INSTRUMENT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	26.9	164.7	124.3	25.8	341.7
1996	82.1	270.4	196.6	39.5	588.6
1997	90.1	290.0	224.2	46.4	650.7
1998	95.2	304.4	252.4	55.7	707.7
1999	90.8	316.7	254.1	58.1	719.7
2000E	125.8	380.3	277.2	61.5	844.8
Forecast					
2001	128.8	388.7	282.7	61.5	861.7
2002	132.6	396.1	288.1	61.5	878.3
2003	136.8	402.8	293.9	61.5	894.9
2004	140.9	409.2	300.3	61.5	911.9
2005	145.6	419.1	306.4	61.5	932.5
2006	150.4	428.7	312.5	61.5	953.1
2007	154.9	439.4	318.7	61.5	974.5
2008	159.6	451.3	324.8	61.5	997.1
2009	164.4	462.6	330.6	61.5	1,019.1
2010	169.5	474.1	336.6	61.5	1,041.6
2011	174.6	485.5	342.3	61.5	1,063.9
2012	180.0	497.1	348.5	61.5	1,087.1

* Source: FAA Air Traffic Activity.

TABLE 44

IFR AIRCRAFT HANDLED

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Thousands)

FISCAL YEAR	IFR AIRCRAFT HANDLED				
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1995	20,993.1	6,946.3	7,824.3	4,385.4	40,149.1
1996	21,944.5	6,656.1	7,857.1	3,961.6	40,419.3
1997	22,514.7	6,826.7	8,175.0	3,895.4	41,411.8
1998	23,227.0	7,137.1	8,641.1	4,190.7	43,195.9
1999	24,044.8	7,732.1	8,808.1	4,069.7	44,654.7
2000E	24,987.1	8,100.9	8,744.4	4,192.4	46,024.8
Forecast					
2001	25,636.8	8,279.1	8,919.3	4,192.4	47,027.6
2002	26,405.9	8,436.4	9,097.7	4,192.4	48,132.4
2003	27,224.4	8,579.8	9,288.7	4,192.4	49,285.4
2004	28,041.2	8,717.1	9,493.1	4,192.4	50,443.8
2005	28,994.6	8,926.3	9,682.9	4,192.4	51,796.3
2006	29,951.4	9,131.6	9,876.6	4,192.4	53,152.0
2007	30,849.9	9,359.9	10,074.1	4,192.4	54,476.4
2008	31,775.4	9,612.6	10,265.5	4,192.4	55,846.0
2009	32,728.7	9,853.0	10,460.6	4,192.4	57,234.7
2010	33,743.3	10,099.3	10,648.9	4,192.4	58,683.9
2011	34,789.3	10,341.7	10,829.9	4,192.4	60,153.3
2012	35,867.8	10,589.9	11,024.8	4,192.4	61,674.9

* Source: FAA Air Traffic Activity.
Note: Detail may not add to total because of rounding.

TABLE 45

IFR DEPARTURES AND OVERS

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Thousands)

FISCAL YEAR	AIR CARRIER		AIR TAXI/COMMUTER		GENERAL AVIATION		MILITARY		TOTAL	
	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS
Historical*										
1995	7,044.6	6,903.9	3,150.3	645.7	3,218.3	1,387.7	1,512.6	1,360.2	14,925.8	10,297.5
1996	7,247.0	7,450.5	3,063.4	529.3	3,198.0	1,461.1	1,329.8	1,302.0	14,838.2	10,742.9
1997	7,301.6	7,911.5	3,127.3	572.1	3,286.5	1,602.0	1,309.9	1,275.6	15,025.3	11,361.2
1998	7,677.1	7,872.8	3,284.7	567.7	3,493.6	1,653.9	1,485.2	1,220.3	15,940.6	11,314.7
1999	7,835.5	8,373.8	3,512.7	706.7	3,535.4	1,737.3	1,467.3	1,135.1	16,350.9	11,952.9
2000E	8,036.2	8,914.7	3,641.4	818.1	3,476.3	1,791.8	1,482.7	1,227.0	16,636.6	12,751.6
Forecast										
2001	8,245.1	9,146.5	3,721.5	836.1	3,545.8	1,827.6	1,482.7	1,227.0	16,995.2	13,037.2
2002	8,492.5	9,420.9	3,792.2	852.0	3,616.7	1,864.2	1,482.7	1,227.0	17,384.2	13,364.0
2003	8,755.8	9,712.9	3,856.7	866.5	3,692.7	1,903.3	1,482.7	1,227.0	17,787.8	13,709.7
2004	9,018.4	10,004.3	3,918.4	880.3	3,773.9	1,945.2	1,482.7	1,227.0	18,193.5	14,056.9
2005	9,325.1	10,344.5	4,012.4	901.5	3,849.4	1,984.1	1,482.7	1,227.0	18,669.6	14,457.0
2006	9,632.8	10,685.8	4,104.7	922.2	3,926.4	2,023.8	1,482.7	1,227.0	19,146.6	14,858.8
2007	9,921.8	11,006.4	4,207.3	945.2	4,004.9	2,064.3	1,482.7	1,227.0	19,616.7	15,242.9
2008	10,219.4	11,336.6	4,320.9	970.8	4,081.0	2,103.5	1,482.7	1,227.0	20,104.1	15,637.9
2009	10,526.0	11,676.7	4,429.0	995.0	4,158.6	2,143.5	1,482.7	1,227.0	20,596.2	16,042.2
2010	10,852.3	12,038.7	4,539.7	1,019.9	4,233.4	2,182.0	1,482.7	1,227.0	21,108.1	16,467.6
2011	11,188.7	12,411.9	4,648.6	1,044.4	4,305.4	2,219.1	1,482.7	1,227.0	21,625.5	16,902.4
2012	11,535.6	12,796.6	4,760.2	1,069.5	4,382.9	2,259.1	1,482.7	1,227.0	22,161.4	17,352.2

* Source: FAA Air Traffic Activity.

Note: Totals may not add because of rounding.

TABLE 46

TOTAL FLIGHT SERVICES

AT FAA FLIGHT SERVICE STATIONS

(In Thousands)

FISCAL YEAR	FLIGHT PLANS ORIGINATED	PILOT BRIEFS	AIRCRAFT CONTACTED	TOTAL FLIGHT SERVICES	FLIGHT SERVICES INCLUDING DUATS
Historical*					
1995	6,328	9,162	4,240	35,220	46,740
1996	6,629	8,692	3,904	34,546	46,606
1997	6,725	8,724	3,704	34,602	48,010
1998	6,493	8,727	3,476	33,916	46,774
1999	6,252	8,293	3,325	32,415	45,785
2000E	5,936	7,699	3,224	30,494	45,496
Forecast					
2001	5,986	7,630	3,176	30,408	46,590
2002	6,025	7,565	3,128	30,308	47,446
2003	6,056	7,504	3,035	30,155	47,961
2004	6,087	7,448	3,018	30,088	48,268
2005	6,114	7,396	2,989	30,009	48,485
2006	6,139	7,348	2,945	29,919	48,701
2007	6,164	7,303	2,899	29,833	48,929
2008	6,185	7,260	2,857	29,747	49,159
2009	6,207	7,224	2,814	29,676	49,412
2010	6,227	7,188	2,772	29,602	49,666
2011	6,248	7,152	2,730	29,530	49,930
2012	6,270	7,116	2,689	29,461	50,201

* Source: FAA Air Traffic Activity.

Notes: Total flight services is equal to the sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted.

TABLE 47

FLIGHT PLANS ORIGINATED

AT FAA FLIGHT SERVICE STATIONS

(In Thousands)

FISCAL YEAR	FLIGHT PLANS ORIGINATED		
	IFR-DVFR	VFR	TOTAL
Historical*			
1995	4,909	1,419	6,328
1996	5,247	1,382	6,629
1997	5,367	1,358	6,725
1998	5,227	1,266	6,493
1999	5,018	1,234	6,252
2000E	4,666	1,270	5,936
Forecast			
2001	4,703	1,283	5,986
2002	4,736	1,289	6,025
2003	4,764	1,292	6,056
2004	4,793	1,294	6,087
2005	4,817	1,297	6,114
2006	4,841	1,298	6,139
2007	4,865	1,299	6,164
2008	4,885	1,300	6,185
2009	4,905	1,302	6,207
2010	4,924	1,303	6,227
2011	4,944	1,304	6,248
2012	4,964	1,306	6,270

* Source: FAA Air Traffic Activity.
Notes: Detail may not add to total because of rounding.

TABLE 48

AIRCRAFT CONTACTED

AT FAA FLIGHT SERVICE STATIONS

(In Thousands)

FISCAL YEAR	USER CATEGORY				FLIGHT RULES		TOTAL
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	IFR-DVFR	VFR	
Historical*							
1995	161	653	3,206	220	1,317	2,923	4,240
1996	141	596	2,971	196	1,164	2,740	3,904
1997	138	588	2,804	174	1,133	2,572	3,704
1998	150	570	2,600	156	1,138	2,338	3,476
1999	136	515	2,524	150	1,044	2,282	3,325
2000E	128	500	2,451	145	963	2,261	3,224
Forecast							
2001	125	484	2,426	141	960	2,216	3,176
2002	122	472	2,395	139	945	2,183	3,128
2003	120	465	2,313	137	935	2,090	3,035
2004	118	453	2,312	135	936	2,082	3,018
2005	116	444	2,296	133	916	2,073	2,989
2006	112	435	2,268	130	898	2,047	2,945
2007	108	425	2,240	126	880	2,020	2,899
2008	107	417	2,210	123	862	1,995	2,857
2009	105	408	2,181	120	843	1,971	2,814
2010	103	400	2,151	118	830	1,942	2,772
2011	101	392	2,122	115	817	1,913	2,730
2012	100	383	2,094	112	804	1,885	2,689

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 49

AUTOMATED FLIGHT SERVICES

DUATS TRANSACTIONS

(In Thousands)

FISCAL YEAR	DUATS FLIGHT PLANS	DUATS TRANSACTIONS	TOTAL DUATS
Historical*			
1995	840	4,920	11,520
1996	911	5,119	12,060
1997	857	5,847	13,408
1998	881	5,548	12,858
1999	724	5,961	13,370
2000E	799	6,702	15,002
Forecast			
2001	854	7,237	16,182
2002	898	7,671	17,138
2003	925	7,978	17,806
2004	952	8,138	18,180
2005	981	8,257	18,476
2006	1,010	8,381	18,782
2007	1,041	8,507	19,096
2008	1,072	8,634	19,412
2009	1,104	8,764	19,736
2010	1,137	8,895	20,064
2011	1,171	9,029	20,400
2012	1,206	9,164	20,740

* Source: FAA Air Traffic Activity. DUATS began in 1990.

Notes: Total DUATS services are equal to the sum of flight plans originated and transactions multiplied by two.